

**OPERATOR'S MANUAL
ELF - IC (ENDLESS LOOP)
FILM TRANSPORT SYSTEM
TD-611**

**OPERATING INSTRUCTIONS
FOR
OPERATION, INSTALLATION & MAINTENANCE
OF
ELF - IC
(ENDLESS LOOP)
FILM TRANSPORT SYSTEM
WITH
MK/MKE MAKE-UP TABLE
(AFTER SERIAL NUMBER 4720)
AND ALL WITH RETROFIT KIT P/N: 193439-001**

**CHRISTIE INCORPORATED
10550 CAMDEN DRIVE
CYPRESS, CA 90630**

**PHONE: (714) 236-8610
FAX : (714) 229-3815**

**ELF-1C (ENDLESS LOOP)
FILM TRANSPORT SYSTEM**

TABLE OF CONTENTS

Section	Paragraph
INTRODUCTION (Section 1)	
List Of Figures.	1-1
General Description	1-2
Unpacking.	1-3
OPERATING INSTRUCTIONS (Section 2)	
ELF Assembly & Lay-Down Roller Assembly Instructions.	2-1 & 2-2
Principles Of Operation & Alignment Procedure	2-3 & 2-4
Make-Up Table Controls & Loading The Platter & Spindle.	2-5 & 2-5
Loading And Unloading Procedures (ELF Platter).	2-7
Loading Film On The AW3 Platters.	2-8
Loading The Center ELF Platter From AW3 Platter.	2-9
MAINTENANCE AND ADJUSTMENTS (Section 3)	
Preventive Maintenance.	3-1
Ordering Parts & ELF Loading Checklist.	3-2 & 3-3
TROUBLESHOOTING	
Autowind Platter & Return Arm.	4-1 & 4-2
Film Breakage & Make-Up Table.	4-3 & 4-4
REPLACEMENT PARTS LIST	
ELF System, Final Assembly.	5-1
Platter Feed Control Assembly & (ELF System).	5-2 & 5-3
Platter Axle (Includes Filter Ass'y) & Control Sensor Position.	5-4
Column and Roller Assembly.	5-5
Platter Arm And Motor Assembly.	5-6
Door Panel And Control Modules.	5-7
MK/Make-Up Table	5-8
BILL OF MATERIALS	
FILM THREADING PROCEDURE & SCHEMATIC	
WARRANTY	

**ELF - IC (ENDLESS LOOP)
FILM TRANSPORT SYSTEM
SECTION 1**

INTRODUCTION

1 - 1 LIST OF FIGURES

Picture 1	Endless Loop System ELF, (Right-Side View)
Picture 2	Endless Loop System ELF, (Left - Side View)
Figure 2	Platter Support Arm And Control Assembly
Figure 3	Speed-Control Mechanism
Figure 4	Endless Loop System, ELF Platter
Figure 5	Make-Up Table
Figure 6	Make-Up Table, (Bottom View)
Figure 7	Control Panel Assembly, (Make-Up Table)
Figure 8	Feed-Control Plate Threading
Figure 9	Control Assembly (Door Opened)
Figure 11	Speed-Setting Template
Figure 12	Loading Bags In Place For Loading Film

1 - 2 DESCRIPTION

The **ELF Film Transport System** is a highly reliable, easy to operate device which automatically rewinds film in a continuous loop as it is being projected, thus eliminating the need for manual rewinding. The system can accommodate up to 18,000 feet of 35 mm film on the ELF platter which provides up to 3 hours and 20 minutes of uninterrupted operation. Once it is installed and operating, it can be left completely unattended and will operate automatically until the film is changed.

The system consists of three individually controlled horizontal platters. The **center platter is the endless loop ELF platter** which will operate in a continuous mode. The top and bottom platters are standard AW3 platters and are used for loading and unloading film program from the ELF platter. They can be also be used in the standard AW3 configuration to run special **"one-time-only"** shows, where the endless mode would not be required (*see Figure 1 & 2*). In the ELF mode, the film is fed from the center of the ELF platter, through the projector and back to the outside of the ELF platter where it is spliced to the tail of the film and formed into a continuous loop.

The film program can then be run continuously without the need for rethreading the projector. In the AW3 mode, the film is fed from the center of either the top or the bottom platter, through the projector, and back to be wound up on the remaining AW3 platter. When the show is completed, the head is rethreaded and taken up on the remaining AW3 platter.

ELF - IC (Endless Loop) Film Transport System Section 1

Each platter is driven by its own highly reliable torque motor which is controlled by its own solid state, modular, speed control card. These cards are located in the hinged door of the column for easy access and service. Each of these speed control cards are in turn controlled by the position of either a film feed arm sensor or a film take-up arm sensor, depending on which mode is required at that time by that platter. Each platter has its own individual film feed and take-up arms.

Each system is supplied with a Make-up table which can be used to either rapidly load or unload a film program from any of the three platters. The Make-up table consists of motorized reel spindle capable of handling either standard 2,000 foot shipping reels or the larger 6,000 foot house reels. It has controls which allow it to control either its motor or any of the platter motors. It also has adjustable film rollers which allow film to be fed to or from any of the three platters.

The ELF system requires only 115 V, single phase, 60 Hz power (also available for 230 V, single phase, 50 Hz power). It is recommended that a separate circuit be provided for each ELF machine.

1 - 3

UNPACKING

The ELF is normally shipped uncrated by van lines within the U.S.A. This provides for expert handling during transit and delivery to the projection booth. The ELF system is crated for freight shipment by truck, airline, or export.

Upon delivery, first verify that the correct number of pieces are received by checking the bill of lading or shipping documents.

Next, thoroughly inspect each item for damage that might have occurred during shipment. Any damage discovered *should be reported immediately to the transportation company for inspection and filing of a claim.*

DO NOT ACCEPT ANY SHIPMENT Until A Complete Inspection Of All Equipment Has Been Finished.

**ELF - IC (ENDLESS LOOP)
FILM TRANSPORT SYSTEM
SECTION 2**

OPERATING INSTRUCTIONS

2 - 1 ELF ASSEMBLY INSTRUCTIONS

Note

Before Beginning The Assembly/Installation Of The ELF System, It Is Important That This Instruction Manual Be Read Thoroughly And Understood.

The Main Column

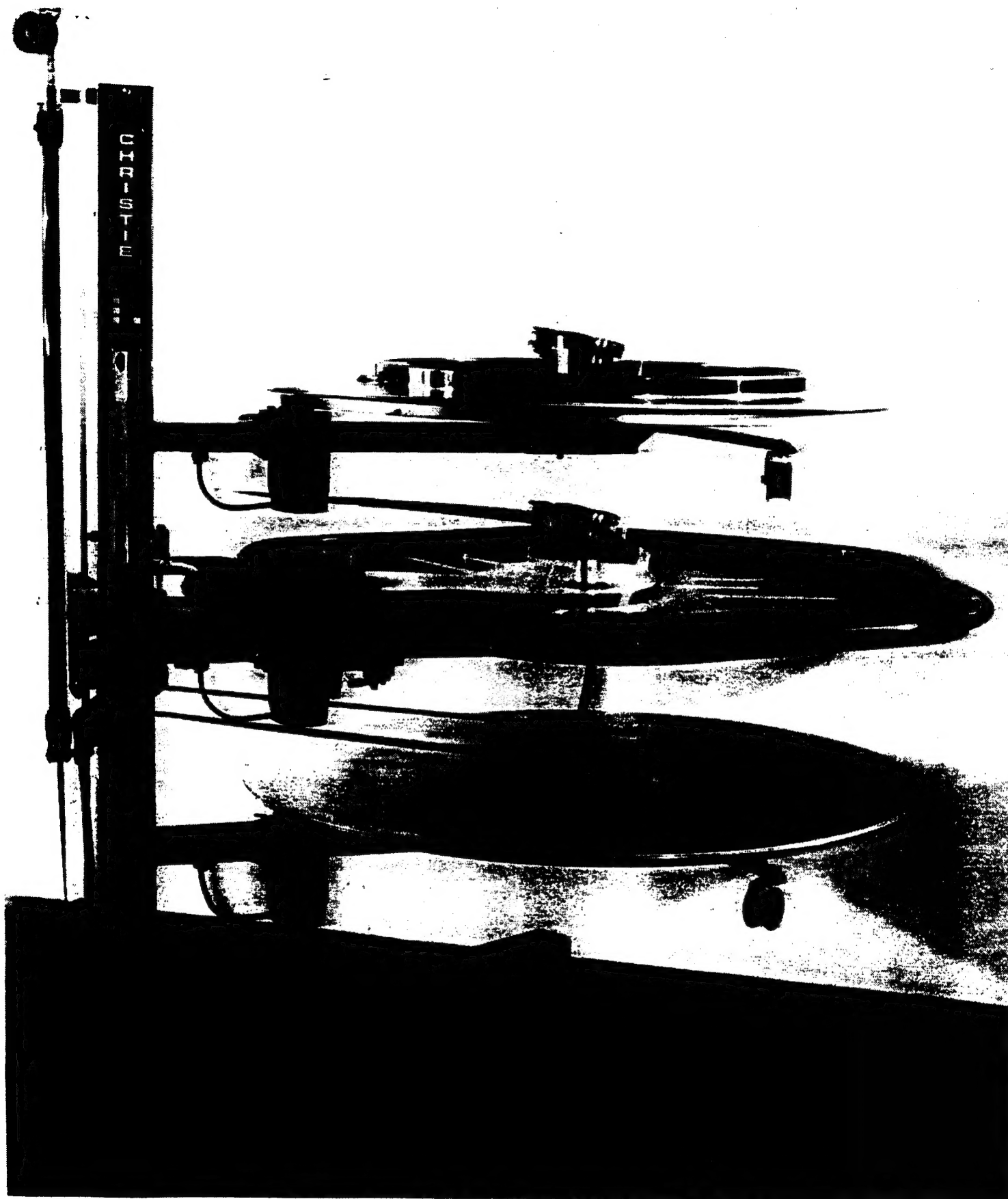
The ELF should be assembled and leveled in the area where it is to be operated near the projector. If space in the projection booth is limited, the ELF can be installed in an adjoining room. In such a case, additional film transport roller assemblies should be installed in order to transmit the film from the ELF to the projector and back. The distance between such roller assemblies should not exceed 10 feet (*Film transport roller assemblies P/N:192706-001 must be ordered separately when required*). The ELF can be installed on either side of the projector. *Picture 1 and 2* show a fully assembled ELF System.

- ◆ Assemble the main column (*Figure 1, #1*) to the base (*Figure 1, #3*), using four 3/8 x 1" hex head capscrews, lockwashers, and washers and tighten securely.
- ◆ Using a carpenter's level, be sure that the column is in a truly vertical position and adjust the leveling feet (*Figure 1, #27*), if necessary to obtain the proper level position.

The Three Drive Motors

- ◆ Place the spring (*Figure 2, #3*), in its housing (*Figure 2, #4*). Push motor assembly (*Figure 2, #2*), toward the support arm, depressing the motor tension spring. Make sure the two flanged bushing (*Figure 2, #5*) are in place.
- ◆ Align the holes in the motor mounting bracket with the holes in the platter support arm (*use a pair of long nosed pliers or any other tapered instrument to align the holes*).
- ◆ Insert the motor assembly mounting bolt (*Figure 2, #6*) upward through the holes until it protrudes through the top of the assembly. Insert the locking pin (*Figure 2, #7*). **Note: If Inserted Through The Top, The Motor Cannot Be Removed Without Disturbing The Platter.**

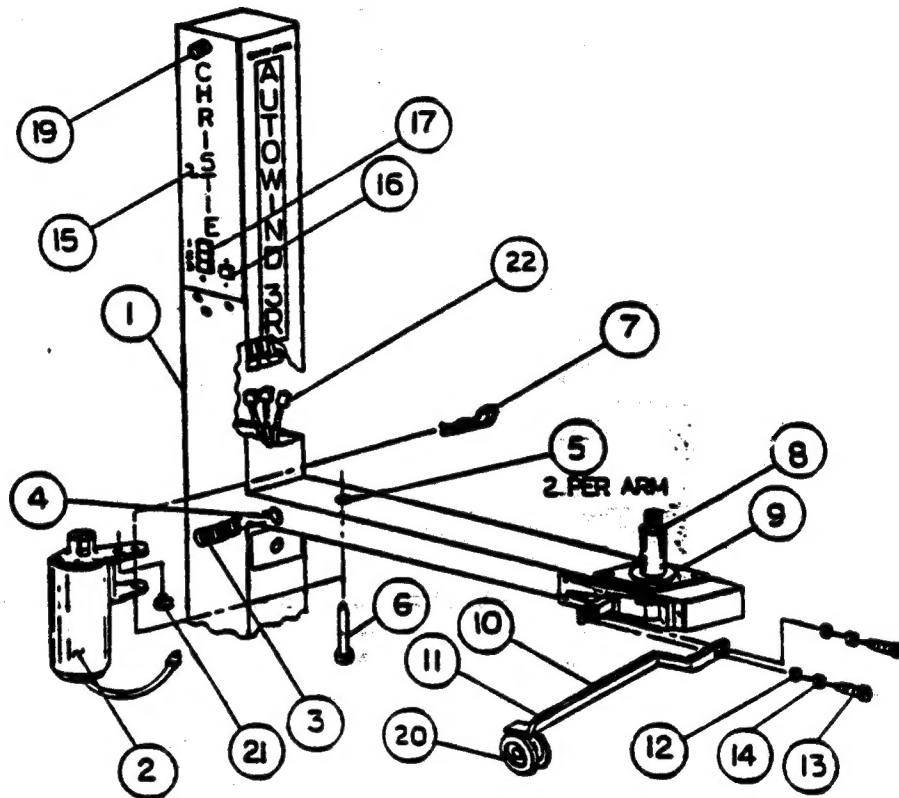
ELF RIGHT SIDE VIEW



PICTURE 1

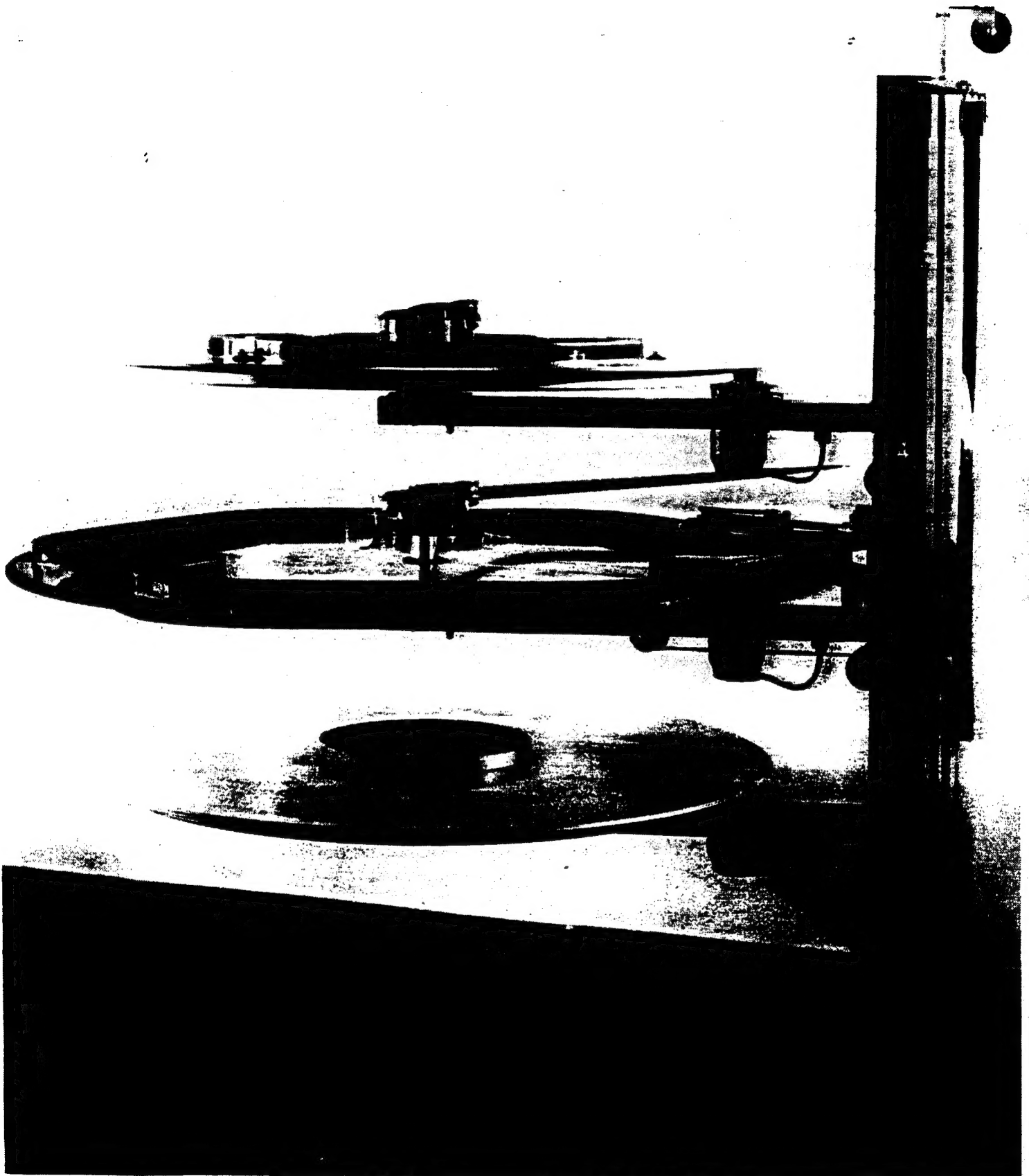
ELF - IC (Endless Loop)
Film Transport System
Section 2

FIGURE 2
PLATTER SUPPORT ARM AND
CONTROL ASSEMBLY



ITEM	PART NO.	NAME	ITEM	PART NO.	NAME
1	193671-001	Column Assembly	12	-	Screw, #10-32 x 2" Lg., Pan Hd.
2	192862-001	Platter Drive Ass'y	13	-	Washer, Lock #10
3	515610-025	Spring	14	-	Washer, Flat #10
4	192477-001	Spring Housing	15	194911-001	Control Module Assembly
5	515000-174	Flanged Bushing	16	578000-042	ON-OFF Switch
6	115419-001	Bolt	17	192994-001	Make-Up Mode (Select Switch)
7	515000-117	Clip	18	-	Screw, #8B x 1/2" Lg., Phillips Pan Head
8	196051-001	Platter Axle	19	515700-118	Captive Screw, #1/4-20
9	515000-157, 158 & 159; (Thrust Bearing Assembly)		20	192879-001	Swivel Roller
10	192835-001	Return Arm assembly	21	518800-008	Rubber Bumper
11	515700-061	"E"-Ring	22	192880-080	Harness Assembly

ELF LEFT SIDE VIEW



PICTURE 2

ELF - IC (Endless Loop) Film Transport System Section 2

The Three Return Arms

The film return arms (*Figure 2, #10*) are installed as shown in (*Figure 2*) by securing two screws and washers (*Figure 2, #12, #13 and #14*). The top and bottom arms are installed with offset facing upwards, however, the center arm is installed facing downwards to clear the metering arm clamp. Reverse the swivel roller assembly (*Figure 2, #20*) as required. See (*Figure 1, #6*) for proper orientation.

The Three Platters

- ◆ Clean the platter axles (*Figure 2, #8*) of all dirt and apply a thin film of *Lubpriplate 130-AA grease*. Also, clean the two platter bearings and bearing cavity to be sure there is no dirt or loose material inside. Apply a thin film of the *Lubpriplate 130-AA grease* to each of the bearings. Install the thrust bearing and thrust washers (*Figure 2, #9*) on each axle and lubricate each with *Lubpriplate 130-AA*.
- ◆ Install the bottom platter first by placing it over the axle and slightly depressing the motor tension spring (*Figure 2, #3*) so that the platter can clear the rubber drive puck and rests completely on the platter bearing assembly. Check rotation to be sure that everything is satisfactory. Next, install the ELF platter on the middle arm in the same manner as step "C" above. The ELF platter is recognized by its larger diameter and the various film control pads attached to the top surface. Install the top platter on the top arm in the same manner as step "C" above.

The Feed Controls Plates

Two center feed plates are supplied with the ELF:

One is a Standard AW3 Feed Control Plate (*Figure 1, #13*), and is normally used to control the film from either of the two AW3 platters. However, for the initial checkout of the ELF system, this feed control plate is also for proper alignment of all three feed control sensors.

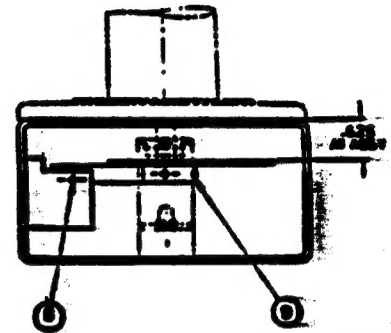
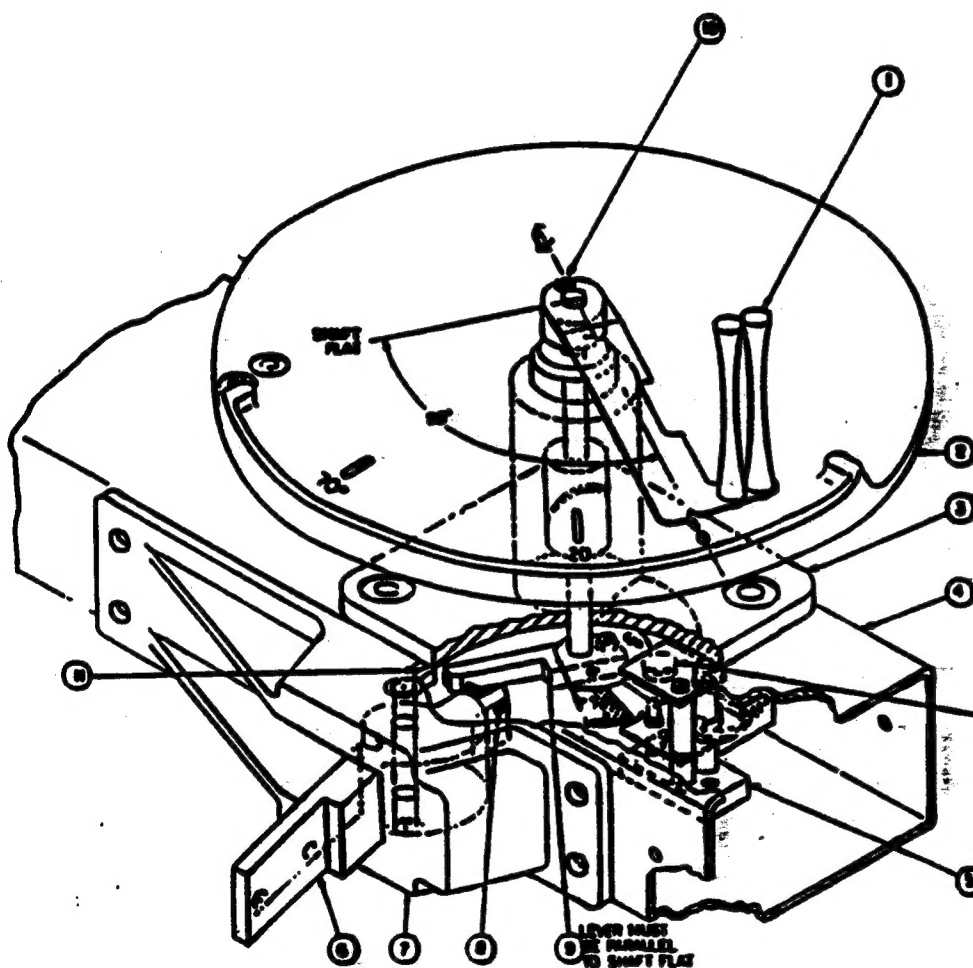
The other one is the Special ELF Feed Control Plate which is supported above the platter on an elevated shaft (*Figure 1, #10*). Two black anodized elevated shafts are supplied with the ELF feed plate.

The first is called the "*Active Shafts*" and can be recognized by its freely rotating coupler which can be seen at its center. It is used only during those times when film is to be unloaded from the ELF platter.

The second is called the "*Passive Shafts*". It has no coupler at its center and is used only during normal Endless film operation.

ELF - IC (Endless Loop) Film Transport System Section 2

SPEED CONTROL MECHANISM

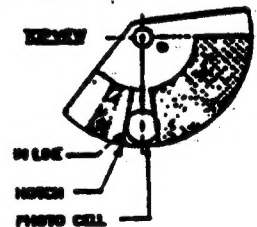


1. FPM POSITION SCREW AND
2. CENTER FEED CONTROL PLATE
3. PLATTER ASSEMBLY
4. PLATTER SUPPORT AND
5. CENTER SENSOR ASSEMBLY
6. SENSOR ARM GEAR
7. SENSOR ARM HUBBING
8. ADJUSTMENT SCREW FOR SETTING
9. VARIABLE DENSITY FILTER ASSEMBLY
10. SCREW (20-35 X 1/4)
11. CLAMP, FILTER LEVER

NOTE:

1. PLATTER REMOVED FOR CLARITY

IN BEST OR 0° POSITION, THE EDGE OF THE CLEAR "WINDOW" WILL BE ALIGNED WITH EDGE OF PHOTO CELL.



**ELF - IC (Endless Loop)
Film Transport System
Section 2**

**SPEED CONTROL
MECHANISM**

ITEM	PART NUMBER	QTY	PART NAME
1	193509-001	1	FILM POSITION SENSOR ASSEMBLY, - (70 mm)
	193509-002	1	FILM POSITION SENSOR ASSEMBLY, - (35 mm)
2	196050-001	1	PLATE FEED CONTROL ASSEMBLY (Complete Assembly - 35 mm)
	193970-001	1	PLATE FEED CONTROL ASSEMBLY (Complete Assembly - 70 mm)
3	196051-001	1	PLATTER AXLE ASSEMBLY
4	193670-001	1	ARM AND COLUMN ASSEMBLY
5	192847-002	1	CONTROL SENSOR ASSEMBLY
6	192820-003	1	CAM
7	192859-001	1	RETURN ARM HOUSING ASSEMBLY
8	515500-081	1	ADJUSTMENT SCREW (0-degree) SETTING
9	193889-001	1	VARIABLE DENSITY FILTER ASSEMBLY
10	-	1	SCREW, #6-32 x 1/4" Lg.
11	193081-001	1	CLAMP FILTER LEVER

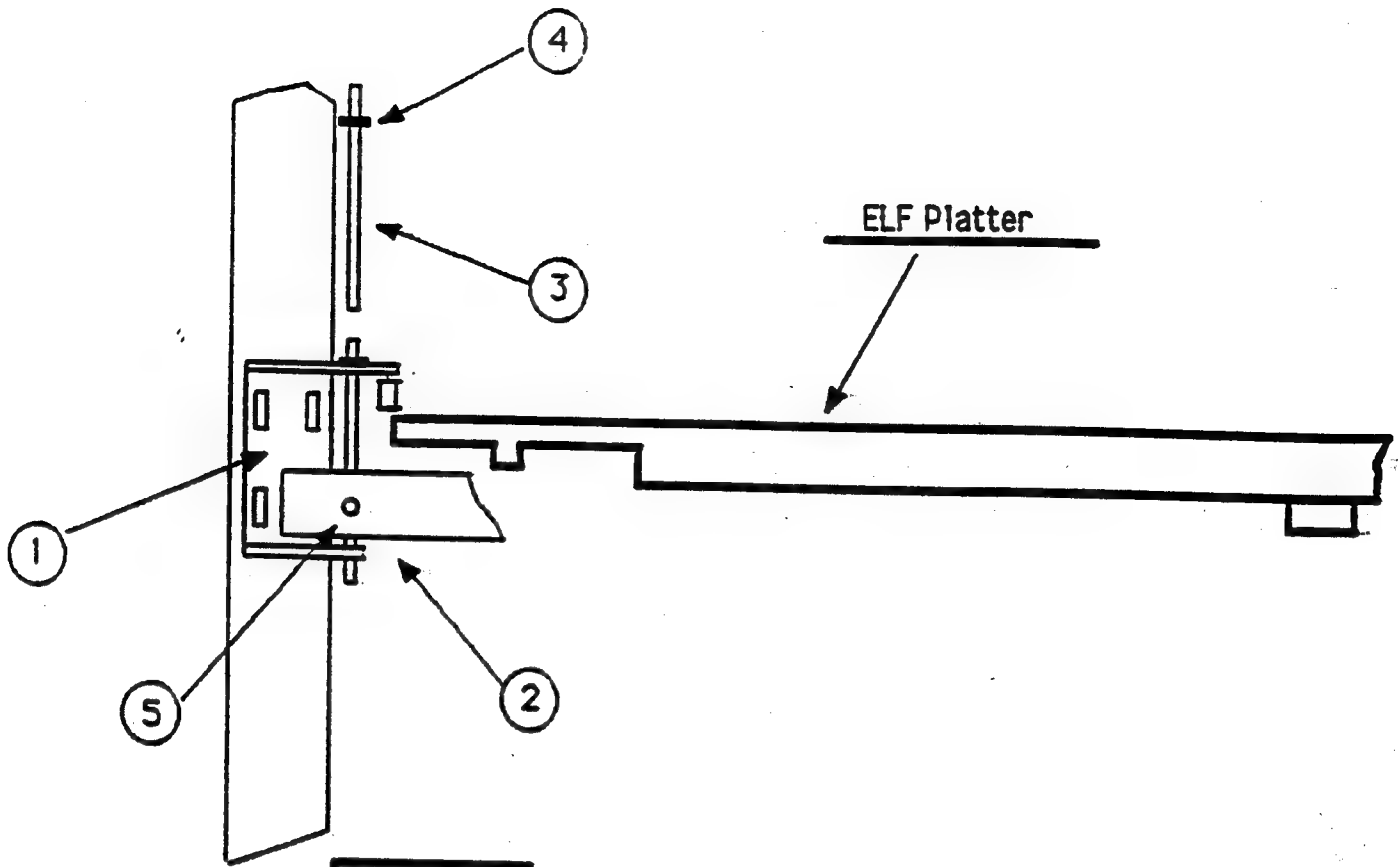


Fig 4-A

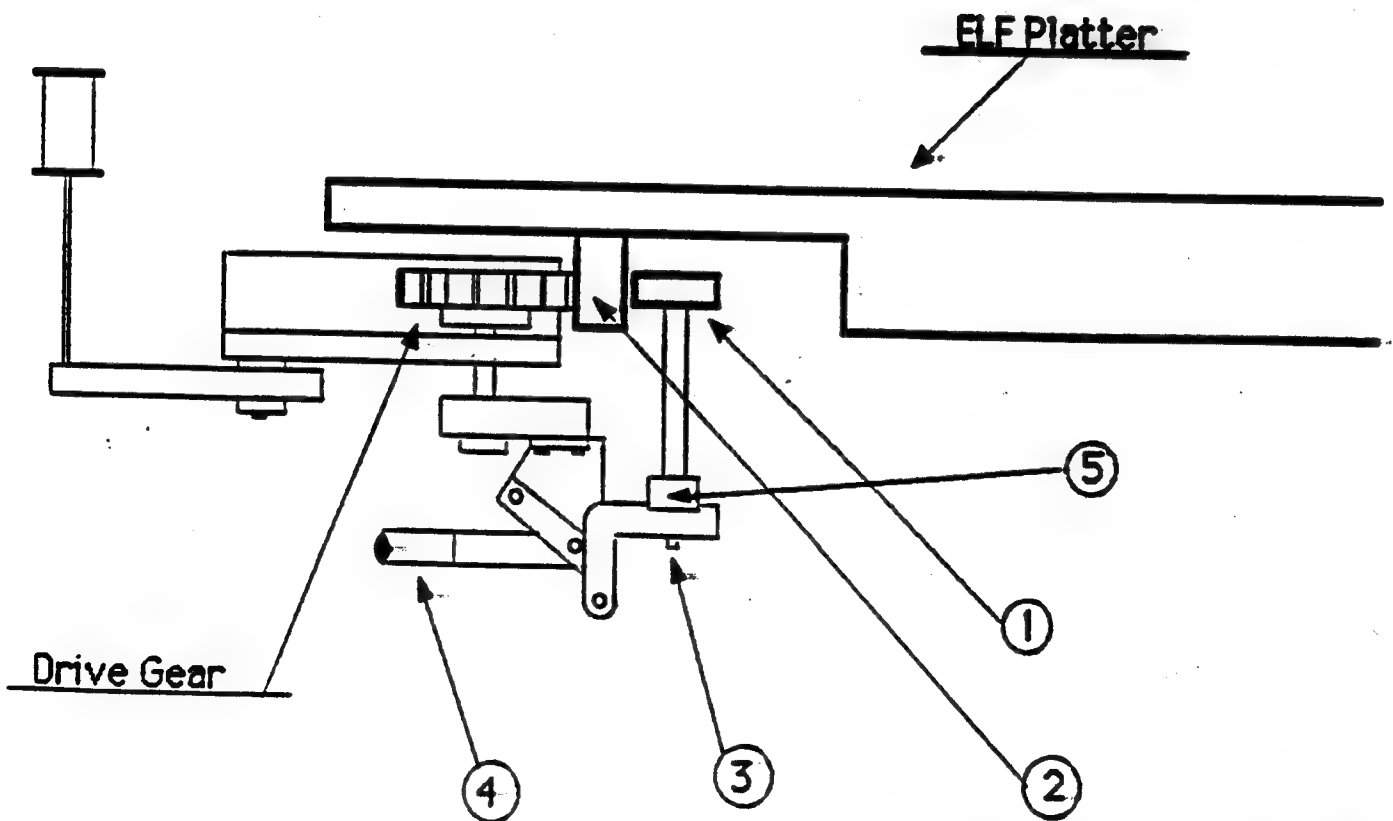


FIG 4-B

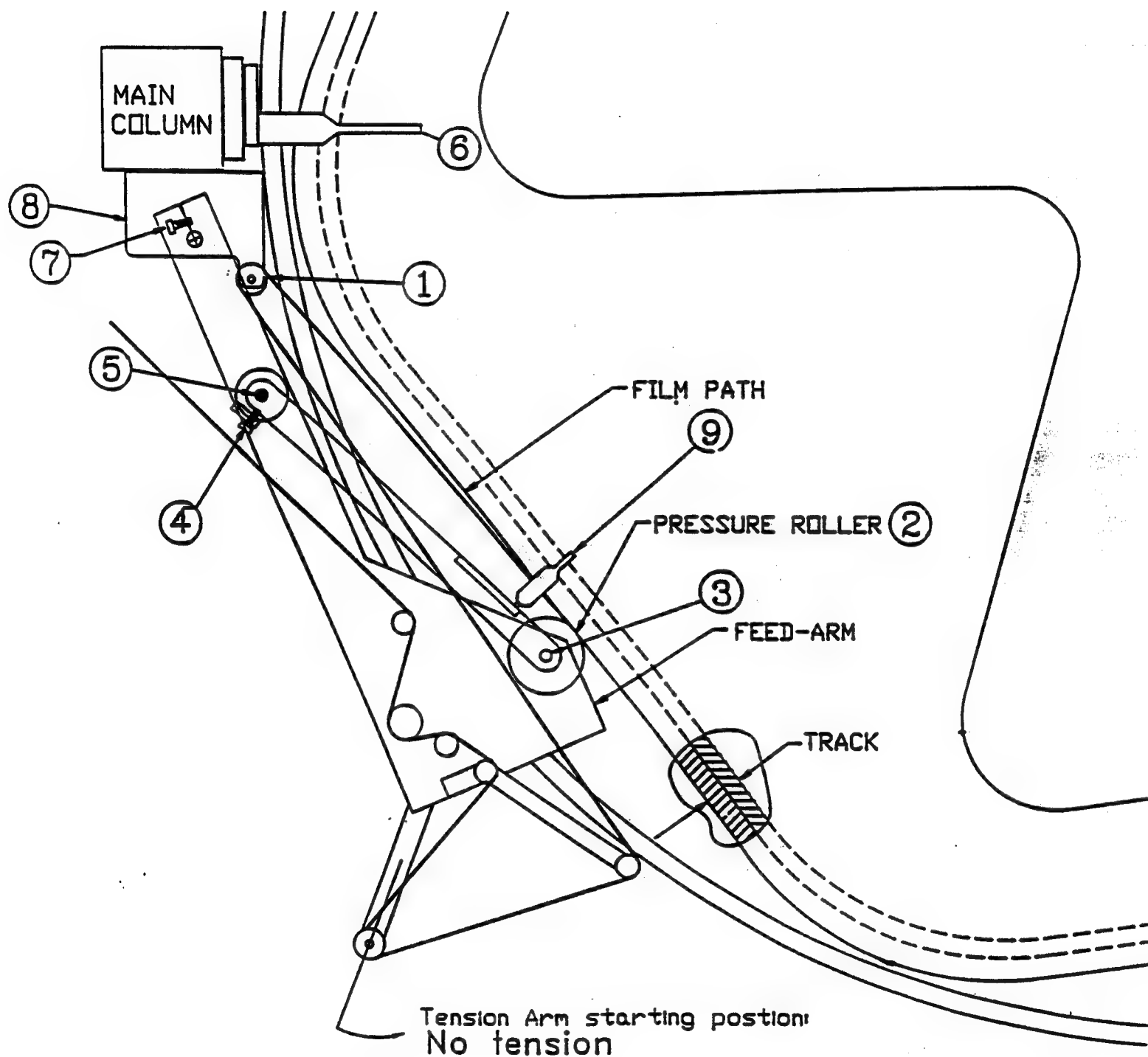


FIG 4-C

ELF - IC (Endless Loop) Film Transport System Section 2

- ◆ Remove dust plug from each platter axle and save for future use. Place the AW3 feed control plate into each platter axle and rotate until it is firmly seated and oriented as shown in *Figure 3*. There is a keying system in both parts to keep orientate the feed control plate. Make sure that the notch on the feed arm (*Figure 3, #1*) is positioned directly over the O (deg.) mark in Rest position for each arm. If the feed plate is properly installed, the feed arm should be able to move freely but will always return to its O (deg.) mark position. Re-adjust the filter mechanism if required to give correct positioning.
- ◆ After all three arms have been checked with the AW3 feed plate, next check the special ELF feed control plate. Place the ELF feed control plate into the silver extension shaft and then into the center feed platter axle until it is oriented in a similar manner to the AW3 plate in (*Figure 3*). There is a similar keying system to help orient the control plate. The film feed-arm should be able to move freely but always return to an extreme right-hand position (*equivalent to the same position as the AW3 control plate*) when not being restrained.

The Column Rollers

There is a take-off roller (*Figure 1, #24*) for each platter which feeds the film from each center feed plate. An additional roller (*Figure 1, #25*) feeds the film from the take-off rollers up to a top roller (*Figure 1, #19*). This in turn feeds film to the feed point adjustment slide rollers on the rear slide bar (*Figure 1, #16*). Another adjustable roller (*Figure 1, #15*) is mounted at the bottom of the column and receives the film from the projector which in turn feeds the roller cluster assembly. See (*Figure 1*) for complete roller installation.

The Slide Bar And Roller Cluster Assembly

Mount the roller cluster assembly (*Figure 1, #17*) on the slide bar (*Figure 1, #8*) and install as shown using two bolts, 20-1/4 x 1-1/2" hex head, two spacers, flat washers and lockwashers.

The Three Slide Bar And Feed Point Adjustment Slide Rollers

Mount the rear slide bar and feed point adjustment slide rollers on the rear of the main column (*Figure 1, #18*) using two bolts 1/4-20 x 3" long hex head, two spacers, two flat washers and two lockwashers. Make sure the feed point adjustment slide rollers (*Figure 1, #16*) is mounted on the rear slide bar before bolting to main column. There is also a swivel roller assembly (*Figure 1, #20*) at the top of the rear slide bar which feeds film to the projector.

The ELF Metering-Arm Assembly

The ELF metering-arm support bracket is located on the main column (*Figure 4-A, #1*). Place the metering-arm (*Figure 4-A, #2*) in position at the support bracket and pass the arm axle (*Figure 4-A, #3*) through the bracket and the arm until it is completely through the bracket assembly.

MAKE-UP TABLE

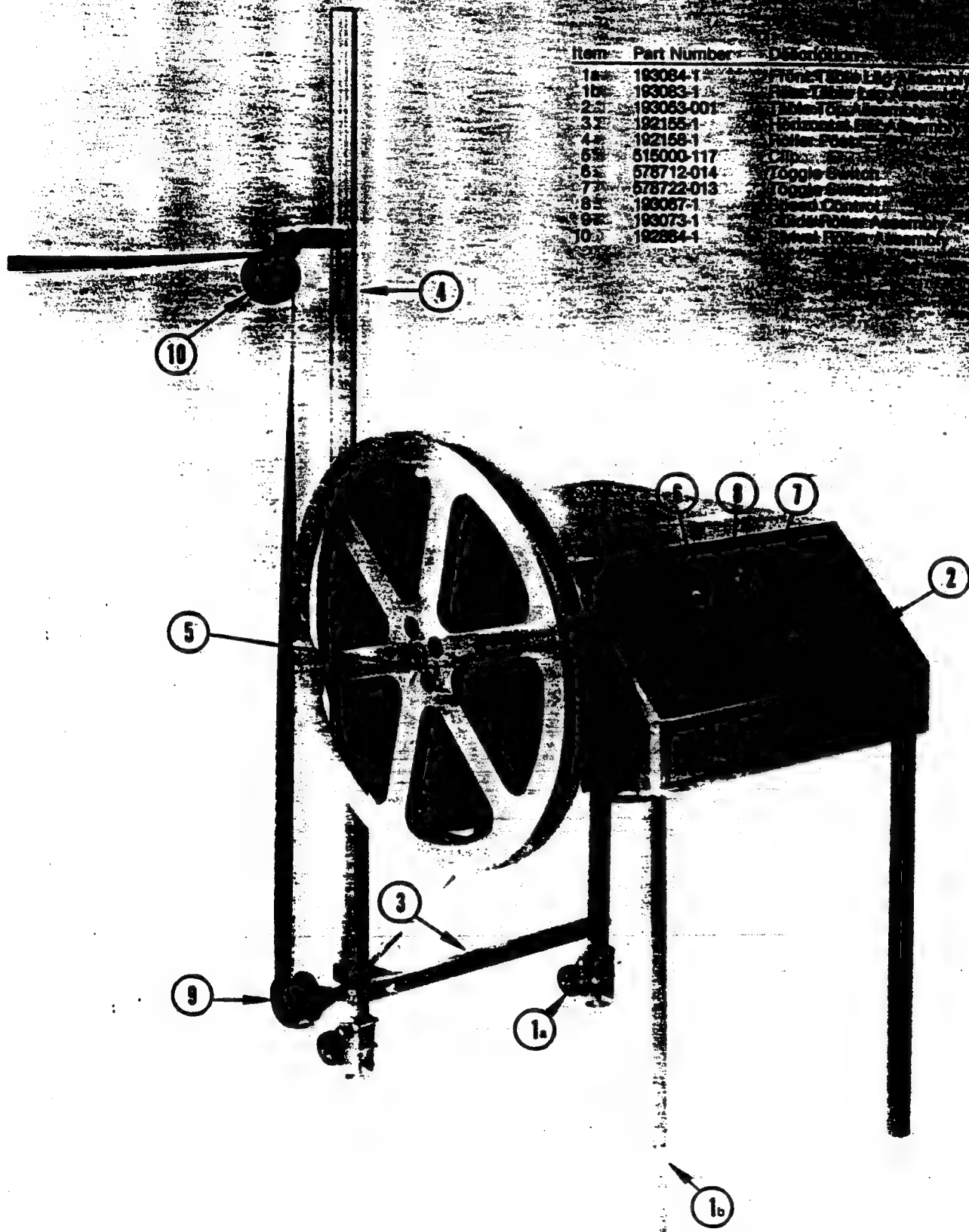


FIGURE 5

MAKE-UP TABLE BOTTOM VIEW

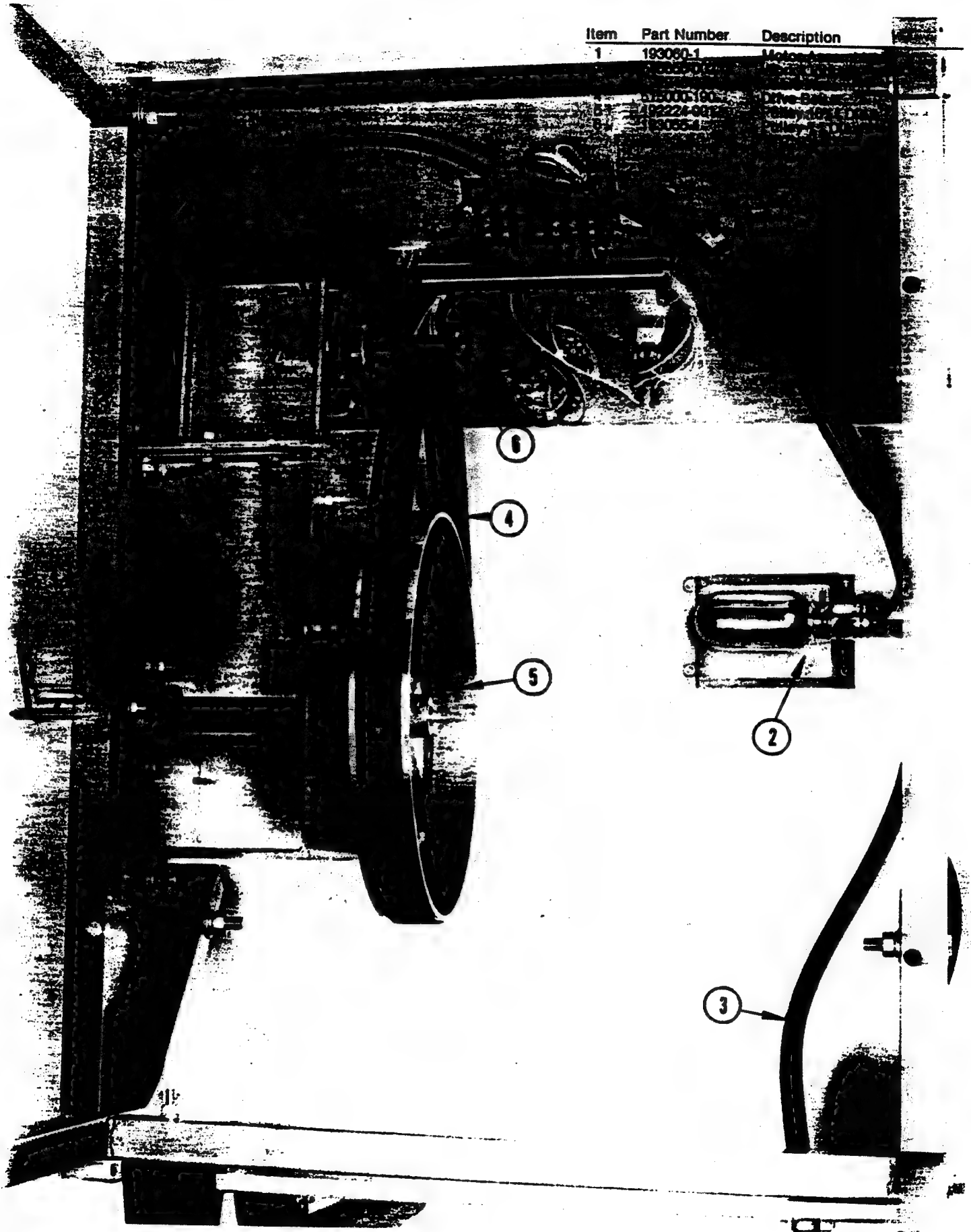


FIGURE 6

CONTROL PANEL ASSEMBLY MAKE-UP TABLE

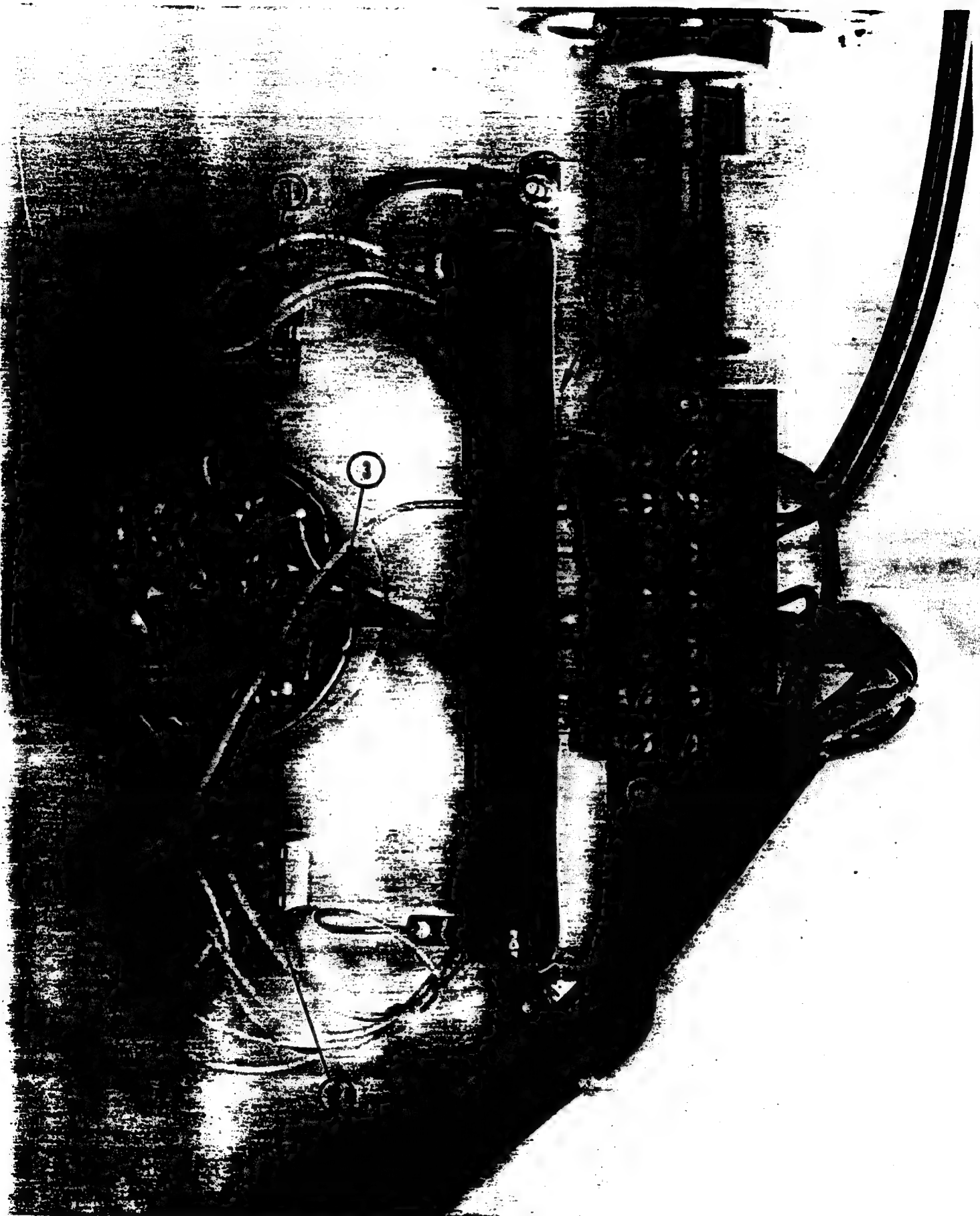


FIGURE 7

FEED CONTROL PLATE THREADING

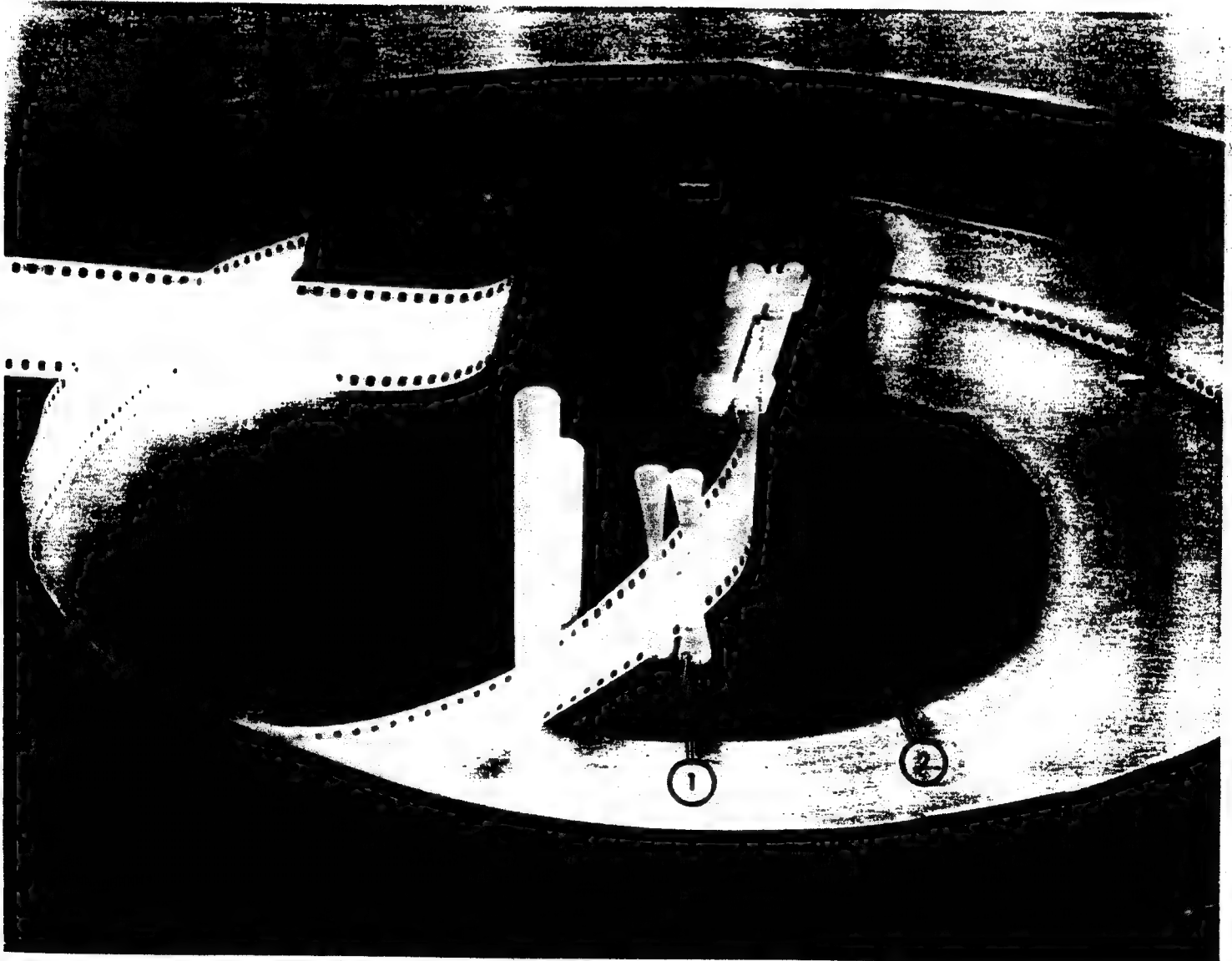


FIGURE 8

**CONTROL ASSEMBLY
(Door Opened)**

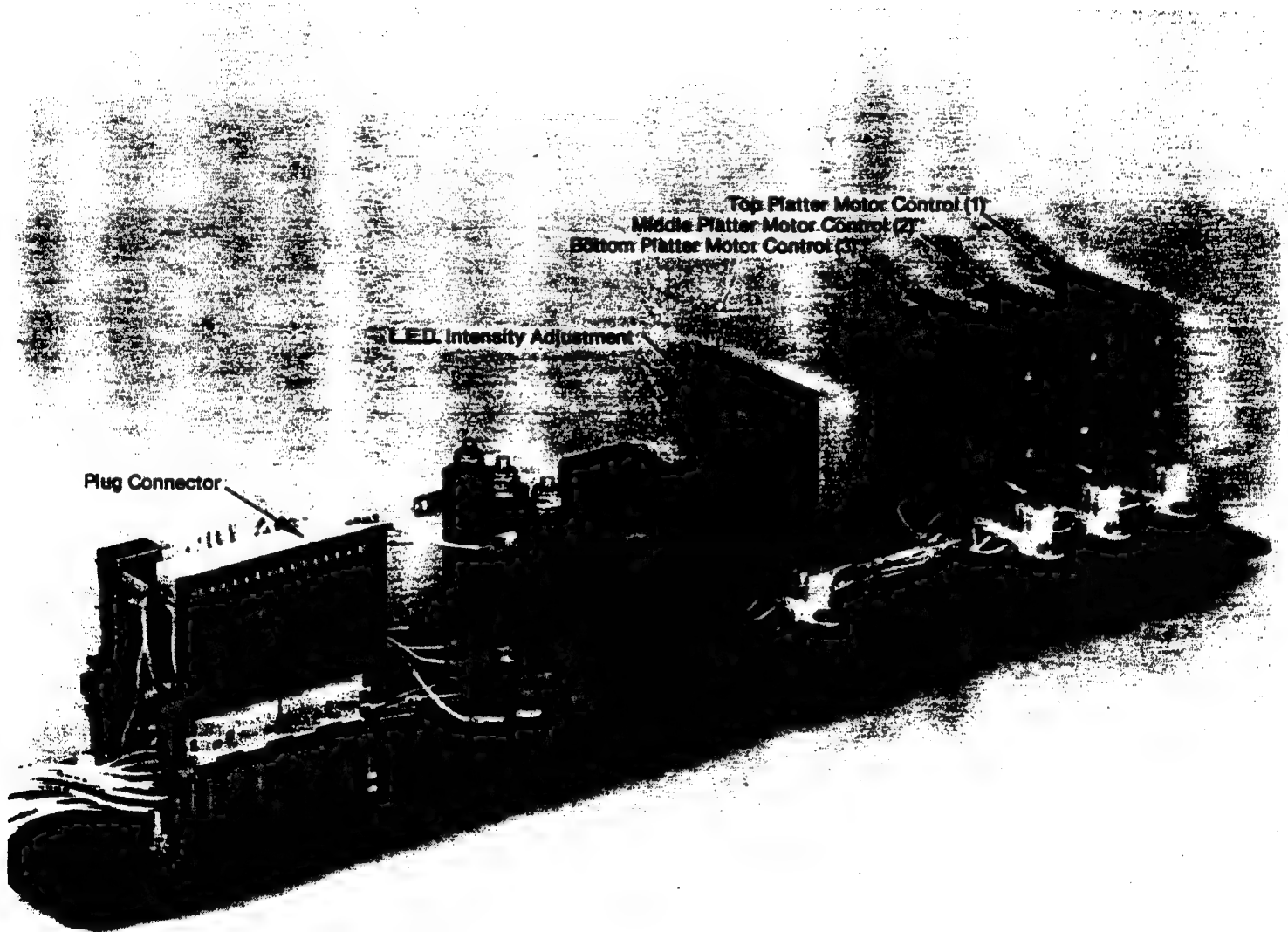


FIGURE 9

ELF - IC (Endless Loop) Film Transport System Section 2

Make sure that the thrust washer is installed under the upper pin of the arm axle (*Figure 4-A, #4*). Lubricate the arm axle bushings with *Lubpriplate 130-AA*.

- ◆ Position the platter so that the bottom edge of the platter is at its lowest point where the metering arm contacts the platter. Adjust the height of the metering arm so that there is 1/16 inch clearance between the top of the metering arm gearbox and the bottom of the platter and secure in place with clamping screw (*Figure 4-A, #5*). Tightening the arm clamp may cause the arm to rise slightly. Rotate the platter several times to be sure of this adjustment and lock it in place.
- ◆ With the drive gear teeth engaged, bring the rubber drive gear "backup roller" (*Figure 4-B, #1*) into contact with the gear of the rubber drive flange (*Figure 4-B, #2*) and adjust the height of this roller to 1/16 inch from the bottom of the drive flange with the platter at its lowest point. Rotate the platter slowly and check that this clearance is maintained. If the clearance change is greater than the run out of the platter, the tracking angle of the backup roller should be checked. Adjust as necessary until the backup roller and the drive gear track correctly.
- ◆ The correct pressure of the backup roller against the drive flange is obtained as follows, first loosen the clamping screw (*Figure 4-B, #3*) then, while pressing the drive gear in contact with the gear track, slide the roller support (*Figure 4-B, #5*) until the backup roller is in contact with the back of the flange. Mark the clamp arm at this point for reference. Now, pre-load the drive gear by moving the roller support bracket inward and past the reference mark 1/32 inch and tighten the clamping screw (*Figure 4-B, #3*). With the power turned ON, use the ELF platter return arm to drive the platter slowly around. Check the contact of the backup roller through several revolutions to be sure that the roller maintains contact and the drive gear cannot lift off and "slip teeth" during the operation. The feed-off roller (*Figure 4-C, #1*) must be adjusted so that its bottom flange is 0 to 1/16 inch below the top of the platter at the rubber pads when the platter is at its highest point. As the film comes onto the platter, the top edge should be the same height as the film on the platter, *(there may be some light contact between the bottom edge of the film and top of the platter at this point)*.
- ◆ The pressure roller height (*Figure 4-C, #2*) must be adjusted so that its bottom edge is 1/16 inch from the top of the platter at the rubber pads when the platter edge is at its highest point *(there will be some light contact on the plastic ramps which is relieved by the travel of the roller up and down on its shaft)*. It is important to check the clearance of the bottom end of the pressure roller shaft (*Figure 4-C, #3*) with the plastic ramps. It should be adjusted to clear all points on the plastic ramps.
- ◆ A check should be made of the initial pressure roller arm adjustment by rotating the platter until the pressure roller is centered upon one of the three plastic ramps. With the tension control arm all the way extended in its roller position, the roller edge should just clear the back of the edge of the ramp at all points along its edge. If this distance is not correct, move the arm to the correct distance by use of the pressure arm adjusting screw (*Figure 4-C, #4*). Before making this adjustment, loosen the pressure-roller arm support screw (*Figure 4-C, #5*). After making the adjustment, be sure to re-tighten the support screw and re-lock the adjustment screw.

**ELF - IC (Endless Loop)
Film Transport System
Section 2**

Note

A More Careful Adjustment Of This Screw Will Be Made Later With The Platter Loaded With Film and Pressure Rooler In Operation.

2 - 2 THE LAY-DOWN ROLLER ASSEMBLY

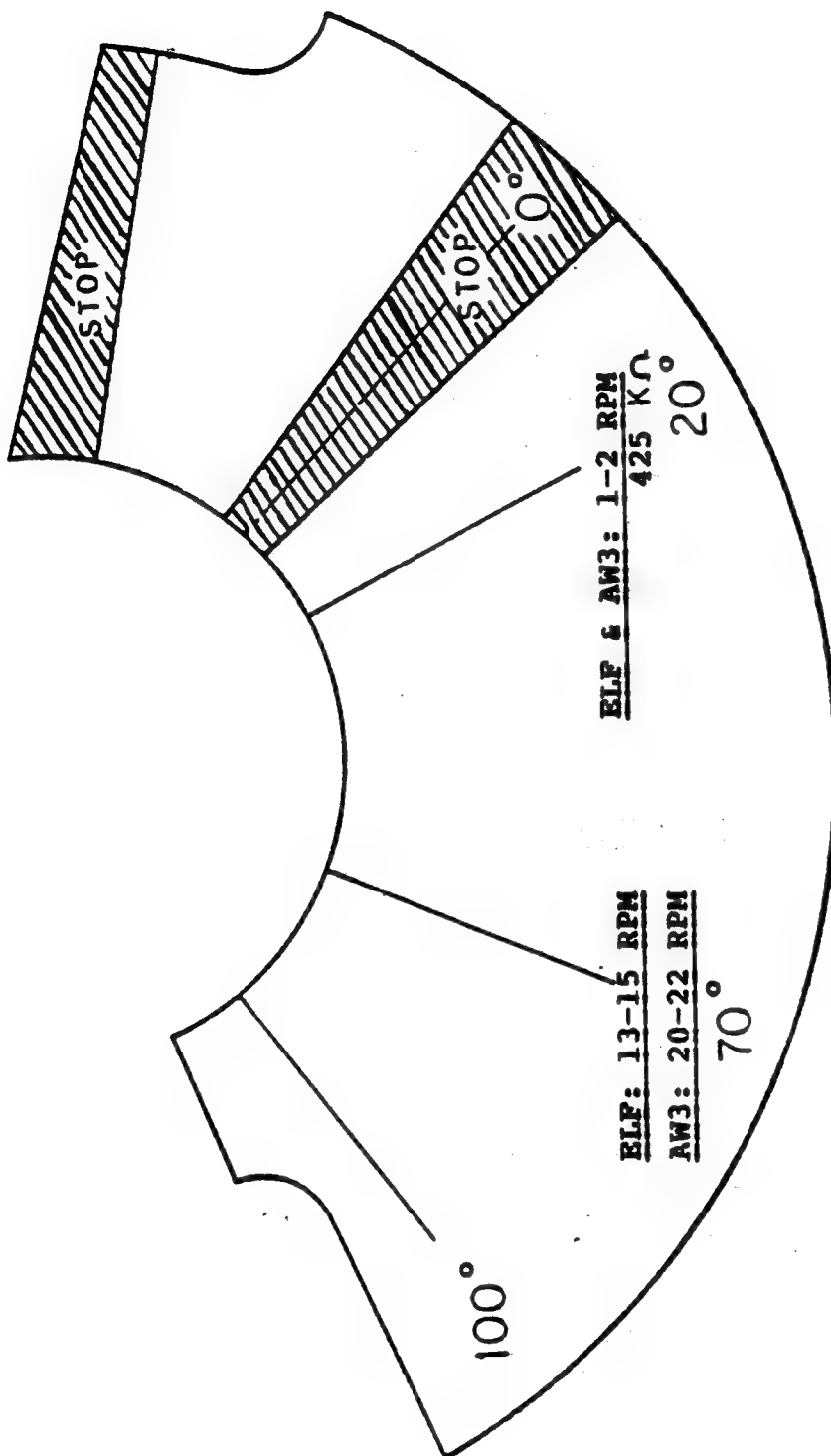
Install the lay-down roller assembly (*Figure 4-C, #6*) on the front of the column over the ELF platter with the detent spring on the left side using the two 1/4-20 x 5/8" socket head capscrews. Place the roller in the park position by moving it upward into the detent spring until the film is started.

Note

This Completes The Main ELF Assembly, Only The Separate Make-Up Assembly Remains.

2.1 The Make-Up Table Assembly

- ◆ Assemble the table legs (*Figure 5, #1-A & 1-B*), to the make-up table top using the eight round screws (3/8 x 11-3/4"), lockwashers and washers
- ◆ Assemble the horizontal bars (*Figure 5, #3*) between the legs and tighten the screws (3/8 x 11-3/4"). lockwashers and washers.
- ◆ Install the roller post (*Figure 5, #4*) onto the make-up table horizontal bars using the stand-off, bolts, nuts and washers. Install the Snap-On swivel roller onto the post, oriented as shown in (*Figure 5, #10*). The Snap-On swivel roller then is adjusted to correspond with the height of whichever platter is being used.
- ◆ With the table standing in the normal position, cut the temporary restraining strap on the drive motor (*Figure 6, #1*) and let it hang free. Lift the motor and install the flat belt (*Figure 2, #4*) over both pulleys and let the motor down so it is supported by the belt. Check that the motor pulleys are correctly aligned and that the belt runs true over the crown of each pulley.
- ◆ Run the cable assembly (*Figure 6, #3*) from the make-up table to the vertical column of the Autowind and insert the six pin plug into the bottom receptacle of the vertical column (*Picture 2, #4*). The make-up table is connected to the ELF only during the loading and unloading of the film and may be disconnected and moved at any other time.



SPEED-SETTING TEMPLATE

**ELF - IC (Endless Loop)
Film Transport System
Section 2**

2 - 3	THE PRINCIPLES OF OPERATION
--------------	------------------------------------

3.1 Operation Of The Film On The AW3 Platters

- ◆ A "film feed arm" (*Figure 3, #1*) controls the speed of the platter which feeds film to the projector. A return arm (*Figure 3, #6*) underneath controls the speed of the platter when it is receiving film from the projector. Each platter is independently driven by a separate D-C permanent-magnet torque motor.
- ◆ The drive motor is controlled by its individual motor speed control card which is located in the control assembly (*Figure 9*). This motor control card operates in conjunction with a control sensor assembly (*Figure 3, #3*) which is located at the end of each platter support arm. *The control sensor consists of a light emitting diode (LED) light source and a photoconductor which is mounted opposite to it and separated by a short distance.*
- ◆ The LED is maintained at a constant preset intensity and a rotating variable density filter operates between the LED and the photoconductor. The variable density filter is rotated by either the center feed plate arm or the return metering arm depending on which mode is being used. Increased or decreased light on the photoconductor causes an increased or decreased current to flow to the motor speed control card. This current is amplified and converted to D-C voltage for the drive motor. This sensor control system provides precise and smooth control of the platter speeds for a long time without requiring adjustment or service.

3.2 The Adjustment Of The Motor Speed Control

Note

<p>All The Motor Speed Controls Have Been Adjusted And Set At The Factory. Further Adjustment Should Not Be Necessary Unless Speed Control Components Are Changed.</p>

- 2.1 The platter axle must be assembled correctly with the variable density filter positioned on the shaft flats and the filter assembly located 5/8" from the base of the axle (*Figure 3*). Turn the power OFF. The film position sensor should be located directly over the O (*deg.*) mark on the feedplate in the **REST position**. Refer to (*Figure 3*) for the correct alignment and adjustment of all speed control mechanism components.

**ELF - IC (Endless Loop)
Film Transport System
Section 2**

- 2.2 Check that the film sensor and return arm mechanism work freely and that **no parts are dragging or contacting improperly**. Remove the appropriate motor speed control card and turn the power ON. Set the film position sensor over 20 (*deg.*) mark on the feed control plate and hold in place. Allow at least two minutes from the time the card has been removed and the power turned ON for the control sensor to reach equilibrium.
- 2.3 Read the resistance across pins 12 and 14 of the motor speed-control card connector. If necessary, adjust the LED intensity to obtain 425 K ohm by turning the appropriate LED potentiometer (*clockwise to decrease intensity*). Allow sufficient time for the control sensor photocell to stabilize. When set in this manner, the LED calibrates the complete system to the correct values.

(As With Previous AW2 And AW3 Systems, It Never Should Be Used To Increase Or Decrease Motor Speeds).

- 2.4 Turn the motor speed control HI POT (*potentiometer*) to mid point of travel. Turn the LO POT to the mid point of travel. Turn the power OFF and install the card. Turn the power ON again.

Note

Touching The Card With The Power ON May Expose Fingers To Electrical Shock.

- 2.5 Set the film position sensor to 70 (*deg.*) mark position and adjust the TOP or BOTTOM platter speed to 20-22 RPM using the HI POT. Adjust the CENTER (*ELF*) platter to 13 to 15 RPM (*clockwise to increase speed*).
- 2.6 Set the film speed arm to 20 (*deg.*) mark position and adjust the speed of a three platters to 1-2 RPM using the LO POT (*clockwise to increase speed*).
- 2.7 Reset the film position sensor to 20 (*deg.*) mark position and allow one minute to stabilize. Recheck and reset RPM of TOP and BOTTOM platter 1-2 RPM, the CENTER (*ELF*) platter to 1-2 RPM, using the LO POT if necessary.

Note

It Is Normal For The Center Platter Speed To Oscillate 6 Time For Each Platter Revolution Because Of The Special Shape Of The Film Formation And The Varying Radius Of Its Outer Layer. DO NOT Attempt To Eliminate These Normal Conditions.

**ELF - IC (Endless Loop)
Film Transport System
Section 2**

- 2.8 Move the film position sensor to the 100 (*deg.*) mark and check the TOP and BOTTOM platter speeds is 25 RPM or more.
- 2.9 Allow the film position sensor to return to 0 (*deg.*) mark position and move the return arm to the full speed position. Check that the TOP and BOTTOM platter speed is 25 RPM or more and that they reach this speed in 20 RPM or more in one second or less.

Note

The ELF Is A Demand System And The Platter Operates At Varying Speeds To Supply The Constant Speed Of The Projector When The Radius Of The Film Is Varying On The Platter. DO NOT Change The Motor Control Card Speeds Once They Have Been Set Using These Procedures. These Procedures Have Been Carefully Determined To Provide The Correct Speeds Of All Conditions Of Either Feed Or Make-Up.

3.3 The ELF Mode Of Operation

The operation of the ELF platter is somewhat different from the standard AW3 mode in that only one platter is being used for both supplying film to the projector and also for taking up the return film from the projector. In this endless mode, since the return arm is used to control the platter's speed, the center feed plate metering arm must be de-activated. This is accomplished by using the "passive" support shaft (*identified by a dot on its side*) with the ELF center feed plate. When the ELF platter is to be unloaded, the "active" support shaft (*identified by having no dot*) is swapped with the "passive" support shaft. The "active" support shaft has an internal coupler which connects the metering arm to the feed sensor. The "passive" support shaft has no internal coupler.

2 - 4	THE ALIGNMENT & CHECK-OUT PROCEDURE W/OUT FILM
--------------	---

- 4.1 Plug the 115 V, 15 Amp., A-C plug from the base of the column (*Picture 2, #5*) into a corresponding grounded wall outlet (*can be furnished for other voltages when specified*).
- 4.2 Insert the six-pin plug from the make-up table into the receptacle on the column (*Picture 2, #4*).

Do Not Mate An Earlier Model AW2 Make-Up Table With The ELF System.

**ELF - IC (Endless Loop)
Film Transport System
Section 2**

4.3 The following controls on the main column assembly (*Figure 2, #15*):

- ◆ Locate the A-C power ON/OFF Switch with integral pilot light (*Figure 2, #16*). This switch and pilot light must be ON before the ELF can be operated, but does not have to be ON for operation of the ELF from the make-up table.
- ◆ Locate the platter select switches (*Figure 2, #17*). Push one of the three switches to select the corresponding platter to be used for making up or tearing down the program.

The Platter Select Switches Are Not Illuminated.

2 - 5	THE MAKE-UP TABLE CONTROLS
--------------	-----------------------------------

- ◆ The Load Spindle/Off/Load Platter Switch (*Figure 5, #6*) is located on the left side of the panel and selects the drive motor of either the platter or the spindle.
- ◆ The Run/Off/Brake Switch is located on the right side of panel (*Figure 5, #7*) energizes the make-up table and controls braking. In order to stop both the platter and the reel spindle when unloading film, quickly switch from Run to Brake and hold that position until the platter stops. Then release the switch toggle to OFF.
- ◆ The Speed Control Knob in the middle (*Figure 5, #8*) controls the platter or spindle speed when making up or tearing down. When turned fully counterclockwise, it will detent in the OFF position.

Caution

In Order To Avoid A High Speed Start, ALWAYS Turn This Speed Control Back To "OFF" After Finishing A Sequence.

2 - 6	LOADING THE PLATTER AND SPINDLE (CHECKOUT)
--------------	---

6.1 Loading Platter (Checkout)

- ◆ Set the Load Spindle/Off/Load Platter Switch in the OFF (*center*) position. Push the make-up mode switch on the main column (*Figure 2, #17*) to select the desired platter. The top switch corresponds to the top platter, the middle switch to the middle platter, and the bottom switch to the bottom platter.

ELF - IC (Endless Loop) Film Transport System Section 2

- ◆ On the make-up table, set the left switch to **Load Platter (down)**; set the right switch to **Run (up)**. Gradually turn the speed control knob (*Figure 5, #8*) clockwise and observe that the correct platter rotates counterclockwise. The maximum speed of the platter should be about 30 RPM. Turn the speed control knob to OFF.

6.2 Loading Spindle (Checkout)

- ◆ Set the left switch (*Figure 5, #6*) to **Load Spindle (up position)**; set the right switch (*Figure 5, #7*) to **Run (up position)**. Turn the speed control knob clockwise. Observe that the spindle of the make-up table turns in a counterclockwise direction.
- ◆ Push the right switch **Run (downward to the Brake position and hold it there)**. Observe that the spindle will turn, and its torque will be proportional to the setting of the speed control knob. Release the **Brake Switch** and let it return to the OFF position. Repeat the above listed steps for all platters. The Make-Up Table may now be disconnected from the Autowind column if desired.

If Any Of The Above Procedures Do Not Checkout Properly, Refer To The Troubleshooting Guide And Schematics.

2 - 7 BASIC LOADING & UNLOADING PROCEDURES FOR THE ELF

The procedure for loading a film program onto the ELF platter for endless operation is to first build up the program at high speed from the make-up table to either the top or bottom AW3 platter. The program is then transferred through the projector at normal speed onto the ELF platter during its first showing. The head and tail of the film program are then spliced together and all subsequent showings will be made in the endless mode.

The ELF platter is unloaded by reversing the above process during the film's last public showing. Using the make-up table, the film program can be broken down onto its shipping reels, at high speed, directly from the AW3 platter.

2 - 8 LOADING FILM ON THE AW3 PLATTERS

For The Initial Checkout Of The Two AW3 Platters, It Is Recommended That A Short Film (5-10 minutes) Be Used To Test The Operation Of Both Platters Before A Full Show Is Loaded Onto The System.

- 8.1 Locate the make-up table about 4-5 feet away from the ELF, with the post end towards the platters. Connect the make-up table cable to the ELF main column (*Picture 2, #4*).

ELC - IC (Endless Loop) Film Transport System Section 2

- 8.2 Place the take-up ring (*Figure 11, #2*) onto the selected platter. Push the corresponding make-up mode switch (*Figure 2, #17*). Place the first reel of film on the spindle of the make-up table (*Figure 5, #5*). Be sure that the film comes off the reel with a clockwise rotation of the table spindle.
- 8.3 Pull the film leader from the reel. Thread the film under the lower roller (*Figure 5, #9*) and over the top swivel roller (*Figure 5, #10*). Be sure that these rollers caster toward the reel and platter respectively. Draw the film toward the take-up ring and place the end of the film in the take-up ring slot (*there must be sufficient leader to run from the ELF to the projector and back to the ELF*). Adjust the height of the top swivel roller so that the film clears the edge of the platter. If the film is too low, it might be scratched. If the film is set too high, it might climb the take-up ring.
- 8.4 Set the left-hand switch (*Figure 5, #6*) on the make-up table to **Load Platter (down)**. Set the right switch (*Figure 5, #7*) to **RUN (up)**. Gradually rotate the speed control knob (*Figure 5, #8*) to increase the speed and wind the film from the reel to the platter. When the reel becomes empty, turn the speed control to **OFF** and push the **Brake** switch to stop the platter.
- 8.5 Cut the tail off the end of the first reel and remove from the reel spindle. Place the tail and the empty reel into the film container. Place the next reel on the reel spindle. Cut off the leader and splice the film to the tail end of the preceding film (*always splice film with tape on both sides of the film*).

After The Splice Is Made, Use A White Or Yellow Marking Crayon Or Tape To Mark The Splice For Future Reference When Tearing Down.

- 8.6 Again, set the right-hand switch to **Run**, turn the speed control to start loading the platter, and let it run until the second reel is empty. Repeat steps # 8.1 - 8.5 above until all reels of the film are loaded onto the platter.
- 8.7 Finally, place the anti-skid clips around the periphery of the wound film after complete make-up. Moisten the cups with water so that they will adhere to the platter more securely. Now, with the AW3 platter loaded the film program is ready to be transferred to the ELF platter during its first showing.

RECOMMENDATION

Although it is possible to build up a film program directly from its 2000 feet shipping reels onto one of the AW3 platters, a better procedure is as follow;

- ◆ Transfer the film from the 2000 feet shipping reels onto a 6000 feet house reel on the re-wind bench (*booth equipment*). During this sequence, the film can be inspected for bad splices, cue marks, and/or other defects. Also, splices can be more easily performed on the re-wind bench.

**ELF - IC (Endless Loop)
Film Transport System
Section 2**

- ◆ Place the 6000 feet reel onto the make-up table reel spindle and transfer it to the AW3 platter.
- ◆ During the transfer period, another 6000 feet reel can be prepared on the re-wind bench (*the average feature can be put on two 6000 feet reels*).

2 - 9

LOADING THE CENTER ELF PLATTER FROM THE AW3 PLATTER

For The Initial Checkout For The ELF Platter, It Is Necessary To Use A Film At Least 75 Minutes Long. This Length Will Allow A Sufficient Bulk Of Film To Be Wound Onto The Platter To Reach The Rubber Ramps Which Are Required For Proper Operation.

The Initial Loading Of The Film On The ELF Platter Is The Most Critical Phase. Use Particular And Attention To Detail During This Sequence To Eliminate Problems And Assure Successful Operation.

- ◆ As mentioned earlier, the recommended method of loading the ELF platter is to first load from the make-up table to either the top or the bottom AW3 platter. Sufficient black frame-line leader (30-45) feet must be spliced to the head of the film so that there will be enough film to return to the ELF machine and have some left over the splice to the tail without slack. It is also important to make sure that the tail of the film program has a recognizable frame-line mark, so that when the head is spliced to the tail it can be spliced in frame. Many films fade to black after the credits and have no such marking. A mechanical frame-line counter is very helpful in identifying the last frames in such an instance.
- ◆ Place the three loading bags around the periphery of the ELF platter so they are equally spaced over the rubber pads (*see Figure 12*) The continuous edge of each loading bag should face the outside of the platter. Rotate the platter slowly by hand and align the loading bags so that the pressure roller contacts the side of the loading bags all the way around, from one end to the other. The film tension control arm should be in its fully extended neutral position during this initial loading phase.
- ◆ Move the large film lay-down roller (*Figure 4-C, #6*) to its upper bracket (*off the film*) detent position. Also, move the small lay-down roller to its position off the film (*Figure 4-C, #9*).
- ◆ Run the film from the center of the AW3 platter to the projector. Thread the film in the normal manner with the number #8 countdown frame in the aperture and back to the return arm of the ELF platter. Run the leader up from the lower return roller to the cluster roller, through the ELF return arm roller, back to the cluster roller, to the ELF metering arm (*see Picture #1*).

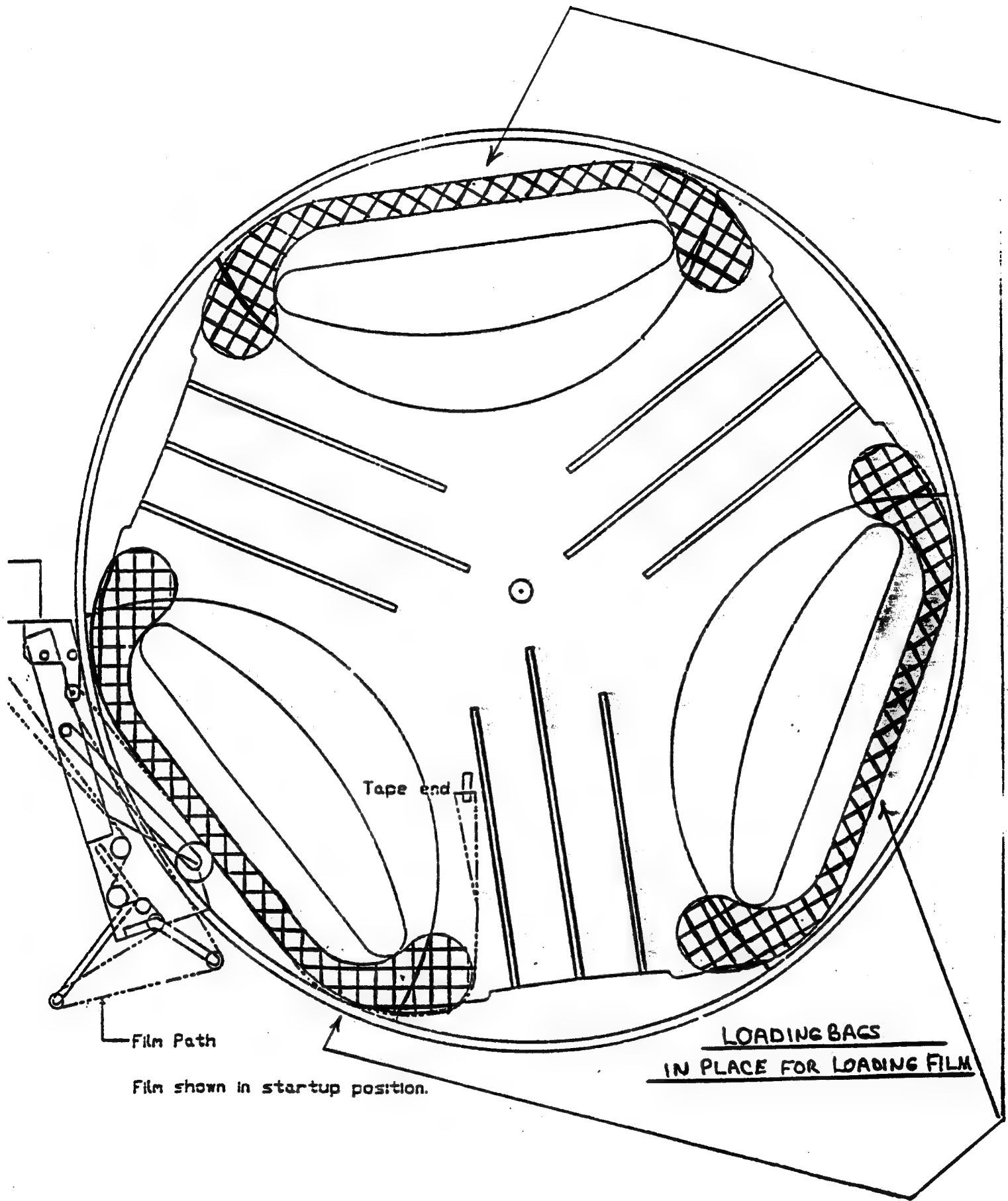


FIGURE 12

**ELF - IC (Endless Loop)
Film Transport System
Section 2**

The Object Is To Have The Film Metered Around The Circumference Of The ELF Platter With At Least Possible Tension At The Start. As The Layers Of Film Build Up, They, Together With The Weight Of The Loading Bag, Will Begin To Provide An Increasing Resistance To The Inward Movement Of The Film. This Will In Turn Begin To Activate The Tension Control Arm. A Fully Loaded ELF Platter Should Not Be Operated Beyond 1-lb. 8-oz Of Tension. This Amount Of Tension Is Indicated By Dots Applied To The End Of The Metering Arm And The Film Tension Arm.

- ◆ Rotate the platter by hand until the pressure roller is adjacent and centered on a loading bag over one of the rubber pads. Check that the drive gear teeth mesh with the platter drive band correctly and be sure that the back-up roller release handle is securely locked in the UP position. Thread the ELF metering arm by passing the leader around the idler roller (*Figure 4-C, #1*) with the sound track edge facing down.

The Optimum Film Cusp Formation And Smooth Operation Of This Machine Will Be Obtained With The Film Emulsion Wound Toward The Inside Of The Platter (*Sound Track Edge Down*).

- ◆ Now, thread film through the sprocket, failsafe rollers, film tensioning roller, past the feed roller, past the loading bag, to the center of the platter. Close the sprocket pad roller to secure the film on the sprocket (*Figure 4-C*) for threading pattern. Carefully pull on the end of the film around the loading bag and toward the center of the platter. Secure the film, in a relaxed condition, to the platter with a piece of tape.
- ◆ Check that the power on the ELF is turned OFF and manually turn the platter counterclockwise (*CCW*) until the slack in the film between the projector and the ELF is taken up and the return arm is about 45 (*deg.*) from the platter support arm. Now, turn the ELF back ON and turn the platter slowly clockwise (*CW*) until the motor starts to take up the load. Carefully re-check that the film path from the projector to the ELF is clear and that the film is threaded correctly through all the rollers and the drive sprocket. The small lay-down roller may be lowered into position at this time. Now the machine is ready for projector start up. After the machine has been started and the film layers are build up to about 1/2", carefully lower the large lay-down roller. The machine can now be left running with the loading bags in place until the feature is loaded or until the film build-up reaches the top of the rubber ramp on the rubber pad.

Do Not Disturb The Position Of The Loading Bags During This Step.

ELF - IC (Endless Loop) Film Transport System Section 2

- ◆ If more than 12,000 feet of film is being added, remove the loading bags after that point. Their function is to provide resistance to the film being loaded and correctly shape the film on the platter. If the loading bags are removed too early, or if their shape is disturbed, the film may become too loose and difficult to control. When the film has reached the top of the rubber ramp, check the position of the film tension control arm. The tension arm should not be beyond the 1 lb.-8 oz. position indicated by the dots. If the tension arm is beyond this line, turn the pressure roller arm adjust screw slightly CW (*Figure 4-C, #4*). Make small increments of adjustments (*about 1/10 turn*) and allow the film tension to stabilize for several revolutions between adjustments. Once this adjustment has been made, it should not have to be made again unless disturbed.

Note

During Operation, Where There Is A Transition Between Different Films Passing Onto The Platter, It Is Normal For The Tension Arm To Move Slightly And Automatically To Adjust The Film Tension For These Different Film Lengths.

- ◆ When the loading process is completed, install the special ELF feed control plate utilizing the active elevated shaft (*plain aluminum*). Rotate the ELF platter until the tail end of the film is completely wound onto the outside of the platter. Secure the end of the film to the previous film wrap with a piece of masking tape in such a way that the masking tape is visible on the top edge of the film. This will enable you to easily spot the tail end when you are ready to join it with the head end. **The failsafe mechanism must be disabled during this step by opening the sprocket pad roller.** Thread the head of the film through the ELF center feed plate and through the column rollers to the projector (*see Figure 4-C*), for threading pattern. Take off enough film to go through the projector and back to the ELF. Turn the ELF power OFF and replace the active elevated shaft (with no dot) on the center feed plate with the passive elevated shaft (with dot). Thread the projector with the number #8 countdown frame in the aperture and take the head end of the film back to the ELF.
- ◆ Thread the head of the film to the return roller on the base of the column, up through the bottom cluster roller, through the ELF return arm, back through the top two cluster rollers, and to the ELF metering arm. **The film should again be positioned so that the sound track edge is facing down.** Remove sufficient leader from the head so that the end of the head will just meet the tail of the film on the platter with the correct positioning of the film tension control arm for startup. Take the temporary tape off the tail of the film and splice the head of the film to the tail on the outer diameter of the ELF Platter making up a continuous loop. Be sure to splice so that the sound tracks are lined up and the films ends are in "frame".

Do Not Put Pressure On The Platter During Splicing.

ELC - IC (Endless Loop) Film Transport System Section 2

- ◆ After splicing, the cue tapes may be added, if fully automatic operation of the projector is going to be used with the ELF film transport system. Turn the platter slowly counterclockwise (*CCW*) by hand to take up the slack film until the return arm is 45 (*deg.*) or less to the support arm.
- ◆ Now, turn the ELF power ON and check operation by backing the platter slightly clockwise (*CW*) until the motor starts to drive the platter. Before re-starting the projector, take some time to carefully re-check the film path to be sure that nothing has been missed in the preceding loading operation. The ELF is now ready for starting. After the projector is started, the feed point adjustment rollers on the rear of the column should be adjusted to obtain the desired take-off position at the center of the platter. These slide rollers is also used to re-adjust the film take-off position in case of a film break, or the addition and/or subtraction of additional film to the existing feature such as trailers.
- ◆ It is useful to know that these slide rollers can adjust about 18 feet of film. There is about 14 feet film for each wrap. By measuring or carefully judging the amount of film added or subtracted, the take-off point can always be made to occur on the platter somewhere on the front 180 (*deg.*) of the platter. This will enhance the even flow of film to the take-off roller assembly.

9.1 UNLOADING THE CENTER ELF PLATTER

The recommended method of unloading the center ELF platter is to break the splice and run the film on the ELF platter through the projector during the last show and back to either of the AW3 platters on the ELF. When the film has been loaded completely onto the AW3 platter, it may then be broken down in the normal manner using the make-up table (*see 11.2*).

The ELF Metering Arm Has A Sprocket. If No Film Is Being Added On The ELF Platter And The Platter Is Being Emptied, Bring The Film Tension Roller All The Way Back And Open The Sprocket Film Pad Roller. This Automatically Defeat The Failsafe Interlock And Allow Manual Operation Of The Machine.

Caution

The Large And Small Lay-Down Rollers Should Be Retracted Into The Upper Detent Position If The Film Is Being Off-Loaded And No New Film Is Being Added. Tape The Loose End Of The Tail So The Film Will Not Come Off The Platter And Dis-engage The Metering Arm From The Platter Using The Lever On The Drive Gear Following Roller Clamp (*see Figure 4-B, #4*).

ELF - IC (Endless Loop)
Film Transport System
Section 2

9.2 **UNLOADING FILM FROM THE AW3 TOP OR BOTTOM PLATTER**

To remove the film from the top of bottom platter, push the appropriate make-up mode switch for the Platter selected (*Figure 2, #17*). Place an empty reel, either 2000 or 3000 feet, on the reel spindle of the make-up table. Take the outside end of the film on the platter to be unloaded, draw it toward the make-up table, and thread it over the top roller (*adjusted to the correct height*) under the bottom roller, then attach it to the empty reel on the reel spindle. Set the left-hand switch to **Load Spindle (UP)** and the right-hand switch to **Run (UP)**. Turn the speed control knob slowly clockwise from **OFF**. This will cause the spindle to rotate and pull the film from the platter as the reel fills up, watch for the splice.

When the splice appears to be 6 to 8 turns from coming off the platter, quickly switch from **Run** to **Brake** and hold it there until the platter stops. Turn the speed control knob back to **OFF**. If the splice is already on the reel, set the left-hand switch to **Load Platter**, set the right-hand switch to **Run**, and turn the speed control knob slowly clockwise.

This will reverse the platter rotation and pull the film back onto the platter until the splice re-appears. Turn the speed control knob back to **OFF**.

**ELF - IC (ENDLESS LOOP)
FILM TRANSPORT SYSTEM
SECTION 3**

MAINTENANCE AND ADJUSTMENTS

The ELF - IC (Endless Loop) FILM TRANSPORT SYSTEM is basically a simple and, therefore, a highly reliable system when properly installed and aligned. In addition, the reliability is increased by the redundancy of a third platter, i.e., if one platter malfunctions, operation can continue on the other two platters.

Furthermore, the motor-control cards are fully interchangeable and can be plugged into any of the three connectors (*see Figure 9*). The drive motors are also interchangeable and are mounted for easy removal and replacement.

However, as with any electro-mechanical system, some basic preventive maintenance should be performed routinely in order to maintain peak system performance.

3 - 1 PREVENTIVE MAINTENANCE

The following checks are recommended:

- 1.1 Check the drive-motor brushes every six (6) months or 1500 hours of operating time. They should be replaced when the length becomes 1/4" or less in order to prevent damage to the commutator.
- 1.2 Periodically check the rubber on the drive-motor wheels. If any of the wheels become excessively worn, they should be replaced. If they are permitted to continue operating when worn too thin, the motor will not apply proper pressure to the hub of the platter causing the drive wheel to slip.
- 1.3 Clean the platter surfaces with "Fantastic", "Like Magic", or detergent and water for normal dust and dirt buildup. **Do not use ABRASIVE types of cleaners.** Solvents may be employed to remove wax or grease buildup but avoid contact with rollers or bearings. Regular cleaning of feed-control plate and rollers with a soft bristle brush will remove dust accumulation.
- 1.4 It is recommended that items described in the "spare parts" list be kept in the projection booth.
- 1.5 The rollers are made of a composition which is normally requires no lubrication. A coating of light machine oil is applied to the roller shaft at the factory in order to prevent corrosion and ensure smooth operation. Roller bearings are used on the make-up table swivel rollers because of the heavy loads and high speeds employed. These roller bearings are lubricated at the factory with LUBRICATE 130-AA.

**ELF - IC (Endless Loop)
Film Transport System
Section 3**

1.6 STATIC ELECTRICITY:

In a soundproof and carpeted projector booth with air conditioning (*particularly in wooden building*) sufficient static electricity may build up on the film to cause oscillation and erratic operation of the metering arm. To prevent static electricity build up, spray the carpet and the area around the ELF with a "static remover" which is readily available in aerosol cans. Also, wipe the edge of the film on the platter with a moist (*not wet*) cloth. This will remove most of the static electricity and ensure smoother operation.

1.7 Note:

If, for any reason during installation, operation, or maintenance of the ELF System, any problems occur which are not covered in the manual; Please write or call:

**CHRISTIE INCORPORATED
10550 Camden Drive
Cypress, CA. 90630**

**Phone : (714) 236-8610
Fax : (714) 229-3815**

3 - 2	ORDERING PARTS <i>or</i> REQUESTING INFORMATION
--------------	--

When ordering parts or requesting information, please include the ELF Model and Serial Number. Also, list parts by Part Number or as described in this manual (*by page and Figure/Table number*). **THE MORE INFORMATION WE RECEIVE, THE BETTER WE CAN SERVE YOU.** When ordering replacement parts, write or telephone your dealer directly.

Please include a Purchase Order Number. This includes replacement parts which are requested under warranty. Credit will be issued when defective parts are received CHRISTIE.

3 - 3	ELF LOADING CHECKLIST
--------------	------------------------------

- 3.1 Load film from the make-up table to the top or bottom AW3 platter.
- 3.2 Splice a long leader to the head of the film.

ELF - IC (Endless Loop) Film Transport System Section 3

- 3.3 Run film from the center of the AW3 platter to the projector. Thread film through the projector and back to the return arm of the center ELF platter.
- 3.4 Engage metering arm with ELF platter and lock the back-up roller into position. Move the large film lay-down roller to its upper (*off the film*) detent position.
- 3.5 Run leader up from the lower return roller to the cluster roller, to the cluster roller, through the ELF return roller, back to the cluster roller, then to the ELF metering arm.
- 3.6 Place the three (3) loading bags around the periphery of the platter equally spaced over the rubber pads. Turn the platter slowly by hand and align the loading bags so that the pressure roller contacts the side of the loading bags (*all the way around*) from one end to the other.
- 3.7 Rotate the platter by hand until the metering arm is adjacent to and centered to one of the rubber pads. Thread the metering arm by passing the leader around the idler roller with the sound track edge down.
- 3.8 Thread the film through the metering arm and past the end of one of the loading bags to the center of the platter. Close the sprocket pad roller.
- 3.9 Carefully pull the end of the film around the loading bag and toward the center of the platter. Secure the film in a relaxed condition to the platter with a piece of tape.

Note

Do Not Disturb The Position Of The Loading Bags.

- 3.10 Turn off the power to the ELF. Manually turn the platter counterclockwise to take up the slack film and until the film has made at least 1 complete rotation around the platter and the return arm is about 45 (*deg.*) from the platter support arm.
- 3.11 Turn on the power to the ELF. Turn the platter slowly clockwise until the motor starts to take up the load. Before re-starting the projector, carefully re-check the film path to be sure nothing has been missed in the preceding loading operation.
- 3.12 Start projector. When 1/2" of the film has built up, lower the large lay-down roller.
- 3.13 Remove the loading bags when the film has reached the top of the rubber ramp.

**ELF - IC (ENDLESS LOOP)
FILM TRANSPORT SYSTEM
SECTION 4**

TROUBLESHOOTING

4 - 1 ELF PLATTER

MALFUNCTION

1.1 *Platter runs too slow (less than 25 RPM for maximum feed/return).*

PROBABLE CAUSE

- A. Motor-speed control not properly adjusted.
- B. Drive wheel slipping.
- C. Motor brushes worn or making poor contact.
- D. AC line voltage too low (*less than 105 volts*).
- E. Platter binding.

CORRECTIVE ACTION

- A. Check motor-speed control as described in *Section 3-2*. Adjust per *Section 2.9*.
- B. Check spring tension on drive wheel assembly. Check wheel condition for wear or dirt. Clean or replace as required.
- C. Check drive-motor brushes. Replace if worn below 1/4" or worn unevenly.
- D. Check A-C voltage. If too low, install (*Variac or step-up transformer to provide 110-120 volts A-C*).
- E. Check platter bearings for condition and lubrication. Relubrication or replace as required.

MALFUNCTION

1.2 *Platter runs too fast (more than 25 RPM for maximum feed/return).*

PROBABLE CAUSE

- A. Motor-speed control not properly adjusted.
- B. AC line voltage too high (*more than 120 volts*).
- C. Light is leaking into the control sensor.

**ELF - IC (Endless Loop)
Film Transport System
Section 4**

CORRECTIVE ACTION

- A. Check motor-speed control as described in *Section 3-2*. Adjust per *Section 2.9*.
- B. Check A-C voltage. If too high, install (*Variac or step-down transformer to provide 100-120 volts A-C*)
- C. Ascertain that end cap is on securely and check that ambient sunlight or work light is not responsible.

MALFUNCTION

1.3 *Platter runs all the time.*

PROBABLE CAUSE

- A. Defective wiring or connections.
- B. Light is leaking into the control sensor
- C. Motor-speed control is not properly adjusted.
- D. Film-position sensor is sticking in ON position.

CORRECTIVE ACTION

- A. Check wiring and connections (*see Section VIII*) and repair or replace as required.
- B. Ensure that end cap is on securely and ambient sunlight/work light is not responsible.
- C. Check the motor-speed control as described in *Section 3-2*. Adjust per *Section 2.9*.
- D. Determine cause of the sticking and correct the situation.

MALFUNCTION

1.4 *Platter will not run at all.*

PROBABLE CAUSE

- A. No A-C voltage.
- B. Platter-mode switch is at inappropriate mode.
- C. Defective wiring or connections.
- D. Defective control sensor.
- E. Defective motor-control card.
- F. Drive motor not plugged in.
- G. Drive wheel loose.

CORRECTIVE ACTION

- A. Provide necessary 100-120 volts A-C. Check that unit is plugged in and switch is ON.
- B. Set mode switch to correct mode.

**ELF - IC (Endless Loop)
Film Transport System
Section 4**

- C. Check wiring diagram and connections.
- D. Check that LED and control sensor in another connector and replace if necessary.
- E. Check motor-control card in another connector and replace if necessary.
- F. Plug in drive-motor assembly into assembly.
- G. Check condition of drive wheel and replace or retighten as required.

4 - 2	RETURN ARM
--------------	-------------------

MALFUNCTION

2.1 Return arm will take-up film slack.

PROBABLE CAUSE

- A. Platter speed too low.
- B. Film-position sensor sticking.
- C. Motor-drive wheel slipping.

CORRECTIVE ACTION

- A. Check platter speed per item #1 of this table.
- B. Determine cause of sticking and correct the situation.
- C. Determine cause of slipping and correct the situation.

4 - 3	FILM BREAKAGE
--------------	----------------------

MALFUNCTION

3.1 Film breakage in make-up or tearing down mode.

PROBABLE CAUSE

- A. Excessive film tension.
- B. High-speed start.

**ELF - IC (Endless Loop)
Film Transport System
Section 4**

CORRECTIVE ACTION

- A. Turn speed down to reduce tension, as needed.
- B. Reset speed control after braking.

4 - 4	MAKE-UP TABLE
--------------	----------------------

MALFUNCTION

4.1 Make-up table will not operate.

PROBABLE CAUSE

- A. Table not plugged into column.
- B. Motor-speed control improperly adjusted.
- C. Motor drive slipping.
- D. Broken belt.
- E. Worn motor brushes.

CORRECTIVE ACTION

- A. Plug in make-up table into column (*be sure that column has power; it is not necessary to push A-C power ON*).
- B. Adjust motor-speed control.
- C. Ascertain that all drive components are securely tightened.
- D. Replace drive belt; check alignment.
- E. Replace motor brushes.

Note

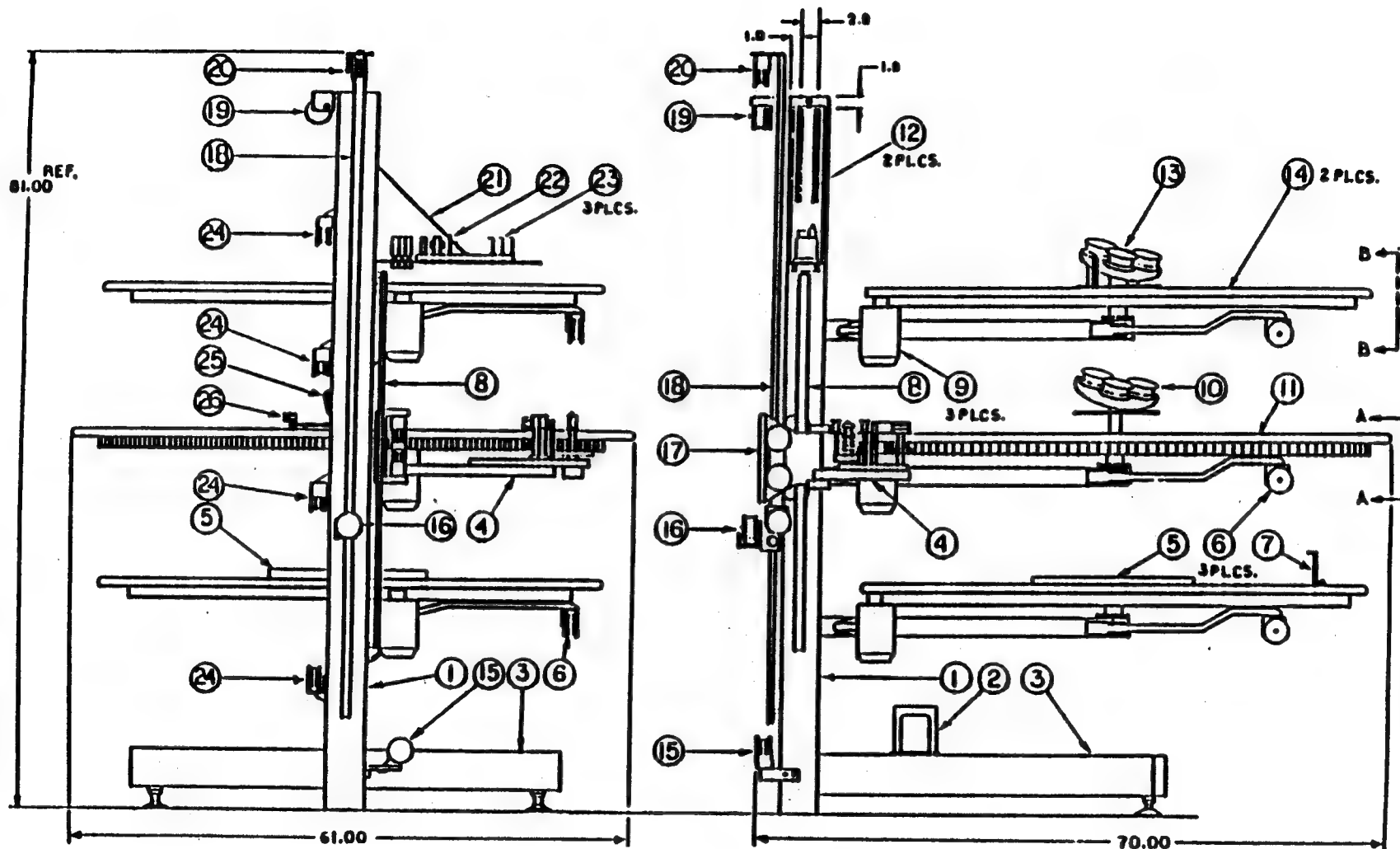
IMPORTANT: Platter drive motors WILL short to ground if too much carbon dust accumulates inside the motor. Remove brush caps and brushes. Blow out carbon dust by using compressed air. This should be done on a regular schedule, at least every three (3) months. This procedure is very important to protect the motor from grounding.

**ELF - IC (ENDLESS LOOP)
FILM TRANSPORT SYSTEM
SECTION 5**

REPLACEMENT PARTS LIST

	<u>PAGE</u>
ENDLESS LOOP SYSTEM (ELF) FINAL ASSEMBLY.....	5-1
PLATTER FEED CONTROL ASSEMBLY (ELF).....	5-2
PLATTER FEED CONTROL ASSEMBLY.....	5-3
PLATTER AXLE ASSEMBLY, (<i>Includes Filter Assembly</i>) & CONTROL SENSOR ASSEMBLY.....	5-4
COLUMN AND ROLLER ASSEMBLY.....	5-5
PLATTER ARM AND MOTOR ASSEMBLY.....	5-6
DOOR PANEL AND CONTROL MODULES.....	5-7
MK MAKE-UP TABLE.....	5-8

FINAL ASSEMBLY OF ENDLESS LOOP SYSTEM (ELF)



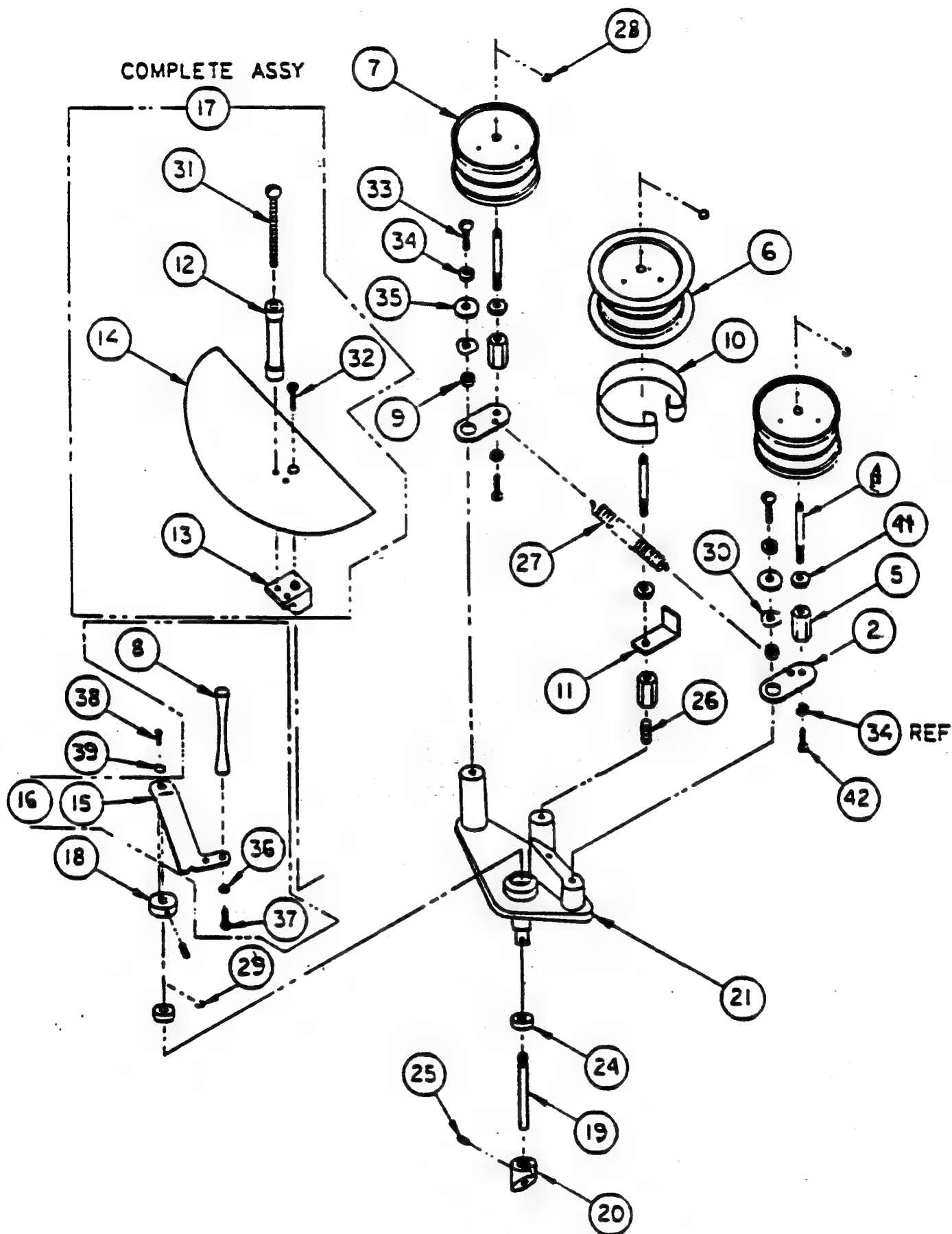
FINAL ASSEMBLY OF ENDLESS LOOP SYSTEM (ELF).

_001 ASS'Y, 115V, 60Hz.
_002 ASS'Y, 230V, 50Hz.

**ELF - IC (Endless Loop)
Film Transport System
Section 5**

**ENDLESS LOOP SYSTEM (ELF)
FINAL ASSEMBLY
Replacement Parts List**

ITEM	PART NUMBER	QTY	PART NAME
1	193670-003	1	COLUMN ASSEMBLY
2	-	1	TRANSFORMER, (230v - IN & 115v - OUT)
3	193564-001	1	BASE ASSEMBLY
4	194034-001	1	GEAR TRAIN ASSEMBLY
5	115713-001	2	TAKE-UP RING ASSEMBLY
6	194215-001	3	SWIVEL ROLLER ASSEMBLY
7	114863-002	8	ANTI-SKID ASSEMBLY
8	194029-001	1	SLIDE BAR ASSEMBLY
9	192862-001	3	PLATTER DRIVE ASSEMBLY
10	194218-001	1	CENTER FEED PLATE ASSEMBLY
11	194205-001	1	PLATTER (ELF-1A)
12	518600-017	24"	STRIP, Sponge Rubber Adhesive Back, #5/16 x 3/8 (2 Pcs.-12" Lg.)
13	194214-001	1	CENTER FEED PLATE ASSEMBLY (AW)
14	192899-001	2	PLATTER ASSEMBLY (Aluminum-AW)
15	194213-001	1	BOTTOM ROLLER ASSEMBLY
16	194225-001	1	SLIDE ROLLER ASSEMBLY
17	194210-001	1	CLUSTER ROLLER ASSEMBLY
18	194046-001	1	REAR SLIDE BAR
19	194216-001	1	TOP ROLLER ASSEMBLY
20	194211-002	1	SWIVEL ROLLER, with Bracket Mounting (P/N: 194148-001)
21	515000-069	15"	CHAIN, with Tubing Cover-14" (P/N: 507701-262)
22	117509-002	1	P.C. BOARD ASSEMBLY (L.E.D. Assembly)
23	192883-001	3	MOTOR CONTROL CARD
24	194211-004	4	SWIVEL ROLLER ASSEMBLY
25	194107-001	1	LAY-DOWN ROLLER ASSEMBLY
26	194206-001	1	PRESSURE ROLLER ASSEMBLY

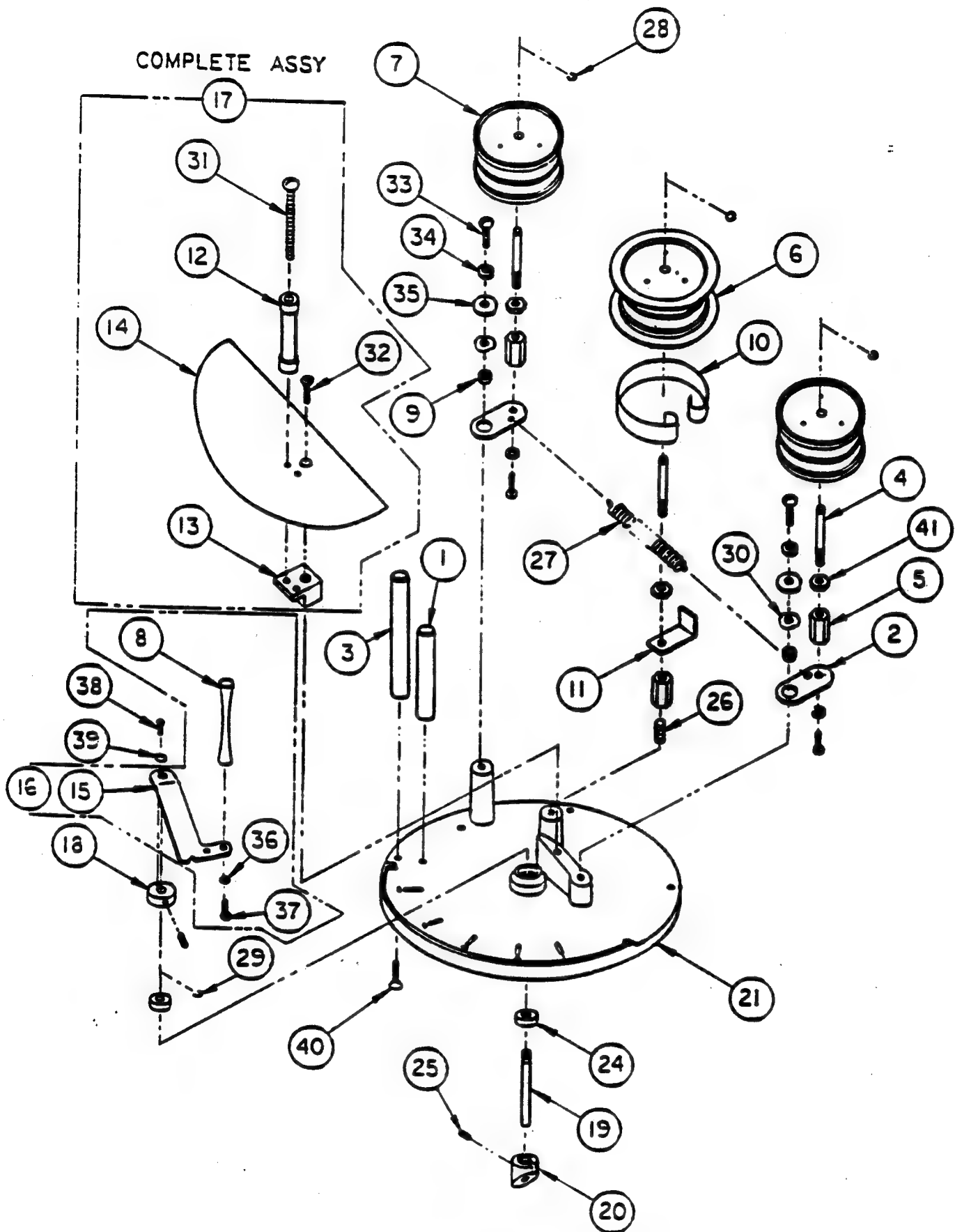


**PLATTER FEED CONTROL ASSEMBLY
ENDLESS LOOP SYSTEM (ELF)**

**ELF - IC (Endless Loop)
Film Transport System
Section 5**

**PLATTER FEED CONTROL
ASSEMBLY ("ELF" System)**

ITEM	PART NUMBER	QTY	PART NAME
1	-	-	-
2	192526-001	2	LINK
3	-	-	-
4	192687-001	3	SHAFT (Roller)
5	192688-016	3	POST (Roller)
6	194158-001	1	ROLLER ASSEMBLY (Center)
7	194158-002	2	ROLLER ASSEMBLY (Tension-Sides)
8	192800-001	2	TIP, (Film Position)
9	192923-001	2	BUSHING
10	193033-001	1	SPRING, STOP
11	193034-002	1	BRACKET, (Stop, Spring)
12	193421-002	2	GUIDE BAR (35 mm)
13	193422-001	1	BRACKET, (Film Guide)
14	193423-001	1	SHIELD
15	193508-001	1	ARM
16	193509-002	1	SENSOR, (Film Position Assembly)
17	193510-002	1	FILM GUIDE ASSEMBLY
18	193880-001	1	ADAPTOR
19	193881-001	1	SHAFT, (Arm)
20	193884-001	1	COUPLING, (Arm)
21	194053-001	1	FEED PLATE CONTROL, (Modified)
22	509101-005	10cc	NUTLOCK
23	509906-001	10	GREASE
24	515000-193	2	BALL BEARING
25	515500-077	2	SCREW, Socket, #10-32 x 1/4" Lg.
26	515500-080	1	SCREW, Socket, #10-32 x 3/4" Lg.
27	515610-026	1	SPRING, (Tension)
28	515700-107	3	E-RING, #1/8 (Inside Diameter)
29	515700-110	1	RING, (Crescent)
30	515819-601	2	WASHER, Spring
31	-	2	SCREW, Round Hd. Slot, #10-32 x 2-1/4" Lg.
32	-	1	SCREW, Flat Head, #10-32 x 3/4" Lg.
33	-	2	SCREW, Pan Head, #10-32 x 1/2" Lg.
34	-	2	WASHER, Splitlock #10
35	-	2	WASHER, Flat Large Pattern Steel #10
36	-	2	WASHER, Splitlock #4
37	-	2	SCREW, Pan Head, #4-40 x 3/8" Lg.
38	-	1	SCREW, Pan Head, #6-32 x 5/16" Lg.
39	-	1	WASHER, Splitlock #6
40	-	4	SCREW, Flat Hd., 100 (deg.) #6-32 x 1/2" Lg.
41	-	3	NUT, #10
42	-	2	SCREW, Pan Head, #10-32 x 3/8" Lg.

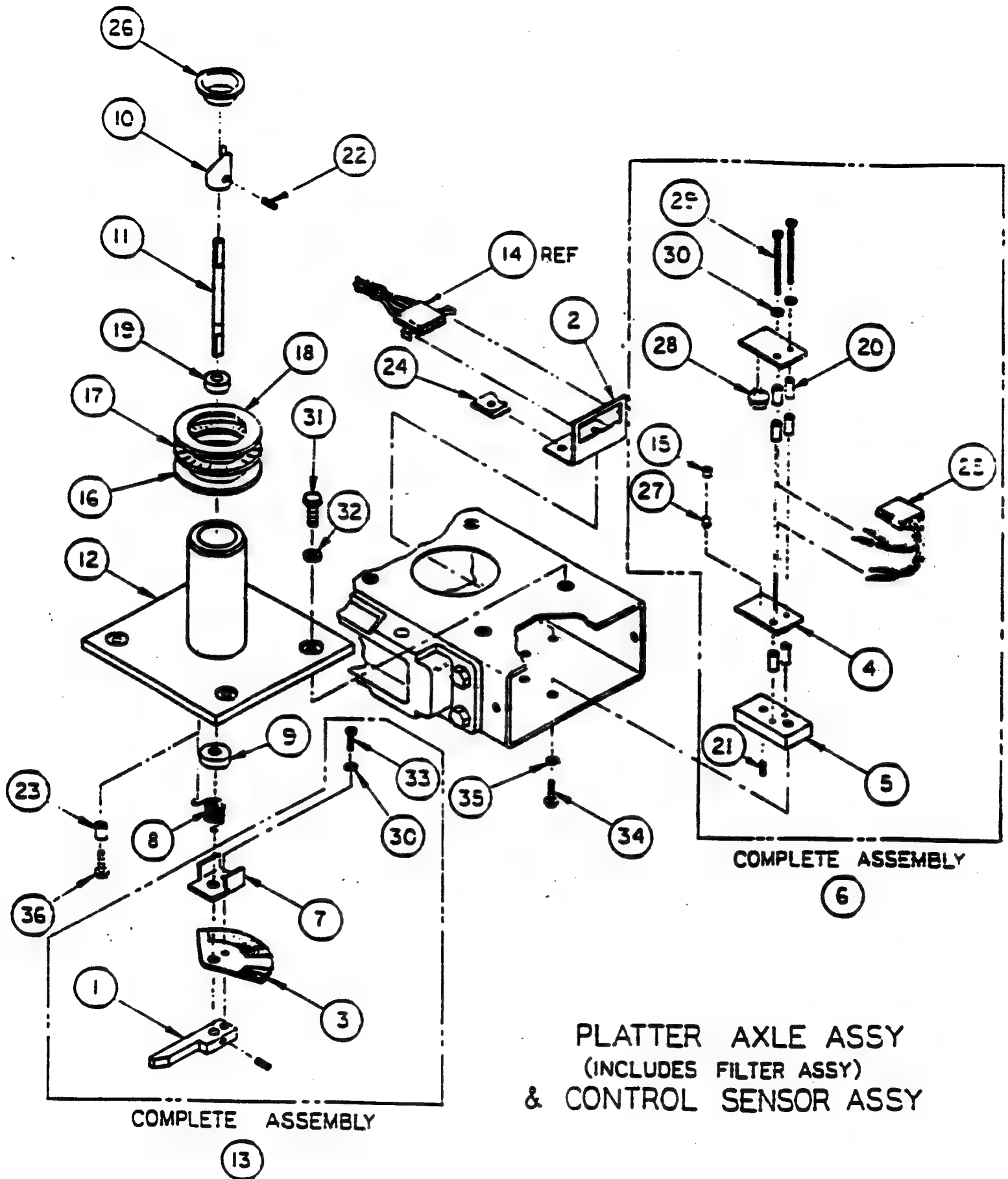


PLATTER FEED CONTROL ASSEMBLY

**ELF - IC (Endless Loop)
Film Transport System
Section 5**

**PLATTER FEED CONTROL
ASSEMBLY (Autowind - AW)**

ITEM	PART NUMBER	QTY	PART NAME
1	115221-001	3	GUIDE PIN
2	192526-001	2	LINK
3	192530-001	1	GUIDE POST
4	192687-001	3	SHAFT (Roller)
5	192688-016	3	POST, (Roller)
6	194158-001	1	ROLLER ASSEMBLY (Center)
7	194158-002	2	ROLLER ASSEMBLY (Tension-Sides)
8	192800-001	2	TIP, (Film Position)
9	192923-001	2	BUSHING
10	193033-001	1	SPRING, STOP
11	193034-002	1	BRACKET, (Stop Spring)
12	193421-002	2	GUIDE BAR, (35 mm)
13	193422-001	1	BRACKET, Film Guide
14	193423-001	1	SHIELD
15	193508-001	1	ARM
16	193509-002	1	SENSOR, (Film Position Assembly)
17	193510-002	1	FILM GUIDE ASSEMBLY
18	193880-001	1	ADAPTOR
19	193881-001	1	SHAFT, (Arm)
20	193884-001	1	COUPLING, (Arm)
21	194900-001	1	FEED PLATE, (Plate Assembly)
22	509101-005	10cc	NUTLOCK
23	509906-001	10	GREASE
24	515000-193	2	BALL BEARING
25	515500-077	2	SCREW, Socket, #10-32 x 1/4" Lg.
26	515500-080	1	SCREW, Socket, #10-32 x 3/4" Lg.
27	515610-026	1	SPRING, Tension
28	515700-107	3	E-RING, #1/8 (Inside Diameter)
29	515700-110	1	RING, Crescent
30	515819-601	2	WASHER, Spring
31	-	2	SCREW, Round Hd. Slot, #10-32 x 2-1/4" Lg.
32	-	1	SCREW, Flat Head, #10-32 x 3/4" Lg.
33	-	2	SCREW, Pan Head, #10-32 x 1/2" Lg.
34	-	2	WASHER, Splitlock #10
35	-	2	WASHER, Flat Large Pattern Steel, #10
36	-	2	WASHER, Splitlock #4
37	-	2	SCREW, Pan Head, #4-40 x 3/8" Lg.
38	-	1	SCREW, Pan Head, #6-32 x 5/16" Lg.
39	-	1	WASHER, Splitlock #6
40	-	4	SCREW, Flat Hd., 100 (deg.), #6-32 x 1/2" Lg.
41	-	3	NUT, #10
42	-	2	SCREW, Pan Head, #10-32 x 3/8" Lg.

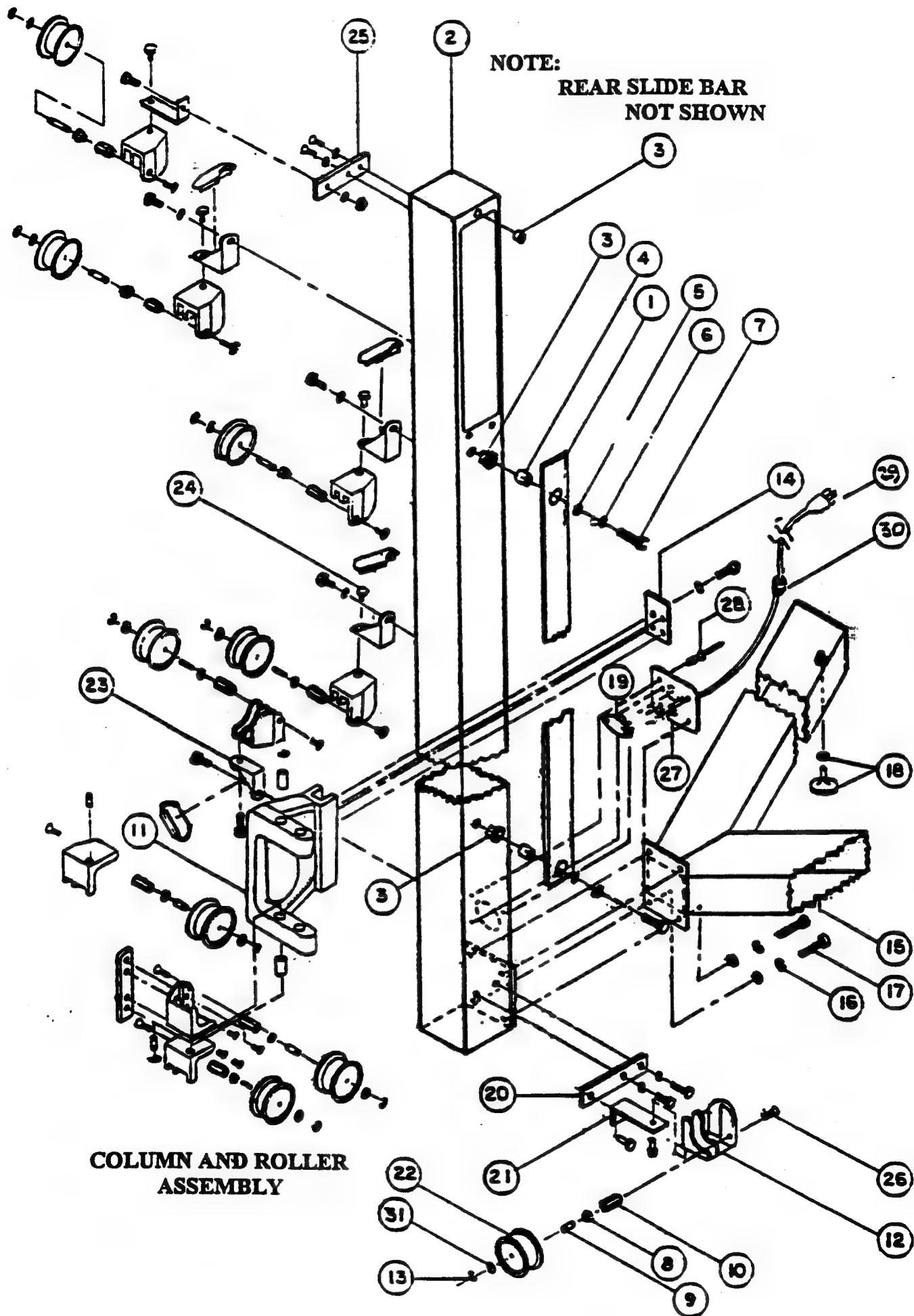


PLATTER AXLE ASSY
(INCLUDES FILTER ASSY)
& CONTROL SENSOR ASSY

**ELF - IC (Endless Loop)
Film Transport System
Section 5**

**PLATTER AXLE ASSEMBLY
(Includes Filter Assembly) &
CONTROL SENSOR ASSEMBLY**

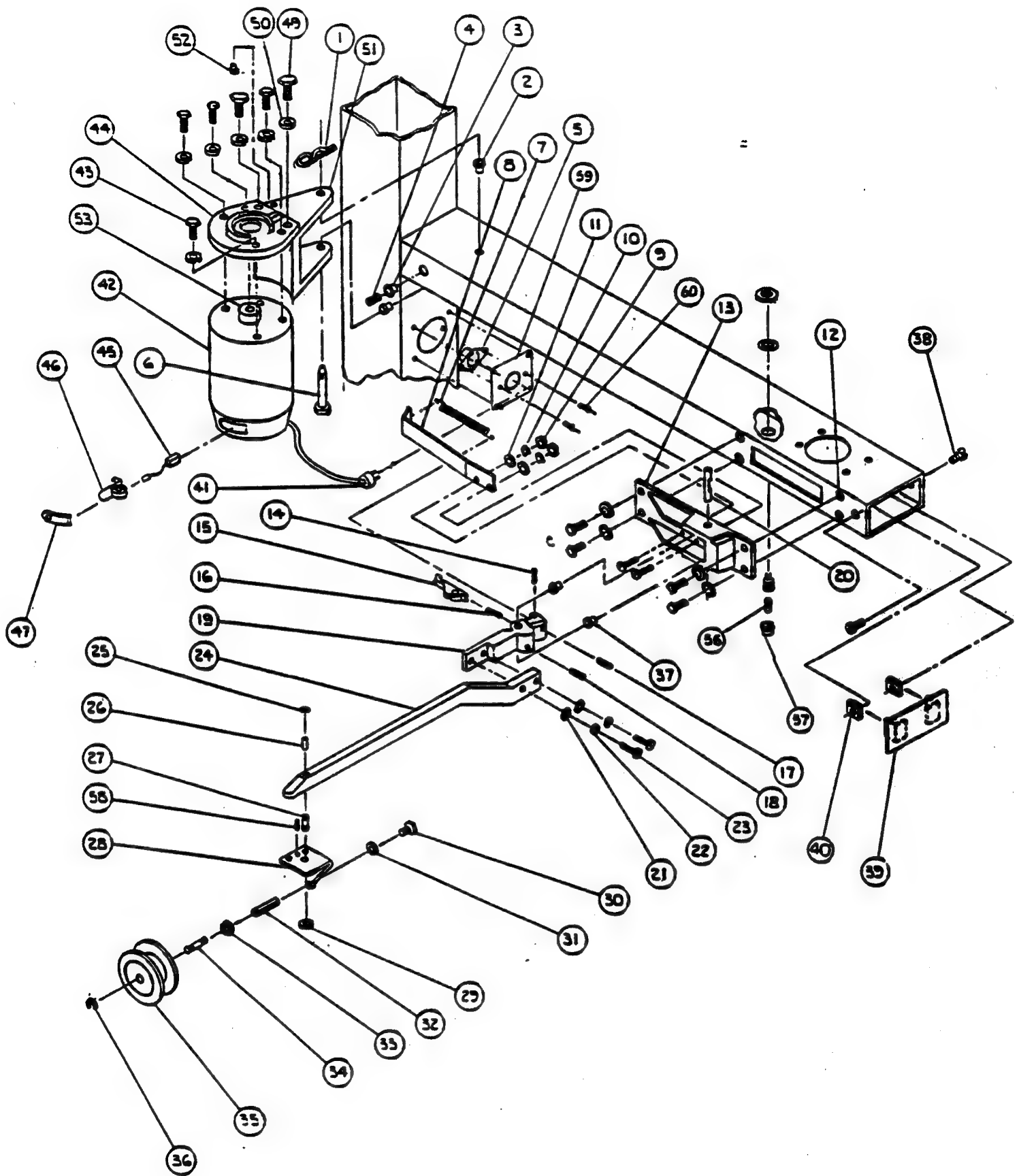
ITEM	PART NUMBER	QTY	PART NAME
1	192795-001	1	LEVER, MOUNT
2	192798-001	1	PLUG, Support Bracket
3	192801-001	1	FILTER
4	192809-001	2	CIRCUIT BOARD
5	192810-001	1	BASE, Control Sensor
6	192847-002	1	CONTROL SENSOR ASSEMBLY
7	193876-001	1	CAM, FILTER
8	193877-001	1	SPRING
9	193878-001	1	BUSHING
10	193882-001	1	COUPLING, FILTER
11	193883-001	1	SHAFT, FILTER
12	194899-001	1	AXLE-PLATTER
13	193889-001	1	FILTER ASSEMBLY
14	-	-	-
15	507717-181	1	SLEEVING, Black
16	515000-157	1	THRUST WASHER, (.094 Thk.)
17	515000-158	1	THRUST BEARING
18	515000-159	1	THRUST WASHER, (.125 Thk.)
19	515000-193	1	BALL BEARING
20	515000-194	6	SPACER
21	515380-037	1	ROLL PIN, #1/4" Lg.
22	515500-077	2	SCREW, Socket, #10-32 x 1/4" Lg.
23	515500-095	1	SPACER
24	515700-112	2	SPEEDNUT, #8
25	524104-010	1	MOLEX CONNECTOR HOUSING
	511327-201	.66'	WIRE, #20
	511327-221	.66'	WIRE, #22
	518900-009	1	TYWRAP, #2
	524900-041	4	PINS, Male
26	524630-034	1	DUST COVER
27	541140-014	1	L.E.D.
28	546899-001	1	PHOTOCELL, CL5M5
29	-	2	SCREW, Pan Hd., Slot Dr., #4-40 x 1-1/2" Lg.
30	-	2	WASHER, Splitlock, #4
31	-	4	SCREW, Hex. Head, #1/4-20 x 5/8" Lg.
32	-	4	WASHER, Splitlock #1/4
33	-	1	SCREW, Phillips Pan Head, #4-40 x 3/8" Lg.
34	-	1	SCREW, Phillips Pan Head, #10-32 x 1/4" Lg.
35	-	1	WASHER, External Starlock #10
36	-	1	SCREW, Phillips Pan Head, #6-32 x 1/2" Lg.



**ELF - IC (Endless Loop)
Film Transport System
Section 5**

**COLUMN AND ROLLER
ASSEMBLY**

ITEM	PART NUMBER	QTY	PART NAME
1	194029-001	1	SLIDE BAR ASSEMBLY
2	193670-003	1	COLUMN & ARM WELDING ASSEMBLY
3	515000-177	49	NUTSERT, #1/4-20, <i>(Part of Item #2)</i>
4	194090-001	2	SPACER, Cluster Slide Bar
5 & 6	-	-	WASHER, Flat #1/4 & Splitlock #1/4
7	-	-	BOLT, Hex. Head, #1/4-20
8	-	11	NUT, Hex. Head, #10-32
9	192687-001	11	SHAFT
10	192688-020	11	POST
11	194223-001	1	BRACKET-CLUSTER
12	194201-002	7	SWIVEL BRACKET
13	515700-107	11	"E" RING
14	192887-002	1	PLATE REST
15	193565-001	1	BASE-WELDMENT ASSEMBLY
16	-	4	WASHER, Splitlock #3/8
17	-	4	BOLT, Hex. Head, #3/8-16 x 3/4" Lg.
18	520650-003	2	FOOT AND LOCK NUT ASSEMBLY
19	524306-003	1	PLUG
20	192875-002	1	BRACKET MOUNTING, <i>(Bottom)</i>
21	192816-009	1	BRACKET, <i>(Angle)</i>
22	194158-001 & -002	11	ROLLER, <i>(35 mm & 70 mm)</i>
23	194200-001	4	BRACKET, Roller
24	-	15	SCREW, Phillips Pan Hd., #1/4-20 x 1/2" Lg.
25	194501-002	1	BRACKET MOUNTING, <i>(Top)</i>
26	-	-	<i>(See Item #24)</i>
27	193553-001	1	PLATE CONNECTOR
28	515310-009	6	POP RIVET, <i>(Aluminum)</i>
29	526030-012	1	LEAD ASSEMBLY
30	518110-004	1	STRAIN RELIEF
31	-	11	WASHER, Flat #10
32	-	19	SCREW, Hex. Head, #1/4-20 x 1/2" Lg.
33	-	4	SCREW, Hex. Head, #1/4-20 x 5/8" Lg.
34	-	7	SCREW, Hex. Head, #1/4-20 x 3/4" Lg.
35	-	3	NUT, #1/4-20
36	192948-002	2	SPACER, SLIDE BAR
37	192816-006	1	BRACKET, BOTTOM ROLLER
38	192985-001	1	SPACE BAR, BOTTOM ROLLER
39	193554-001	1	PLATE CONNECTOR
40	-	2	SCREW, Flat Head, #1/4-20
41	192815-002	2	BRACKET, <i>(Double Idler)</i>
42	192983-002	1	BRACKET, <i>(Double Idler)</i>
43	192816-002	2	BRACKET, Top and Bottom Roller



**PLATTER ARM AND
MOTOR ASSEMBLY**

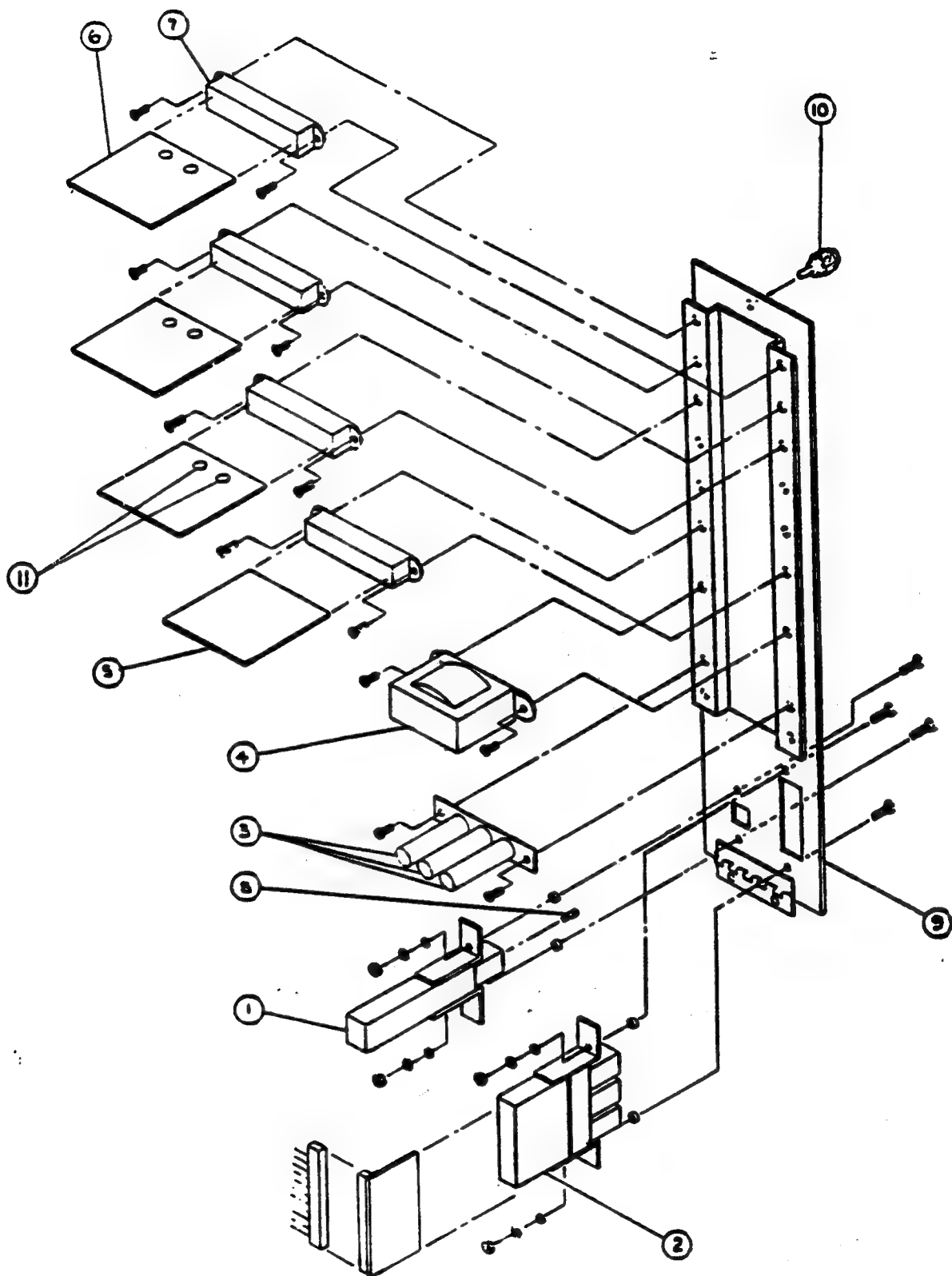
**ELF - IC (Endless Loop)
Film Transport System
Section 5**

**PLATTER ARM AND MOTOR
ASSEMBLY**

ITEM	PART NUMBER	QTY	PART NAME
1	515000-117	3	COTTER PIN, #2-11/16
2	515000-174	6	FLANGE BEARING
3	192477-001	3	HOUSING SPRING
4	515610-025	3	SPRING
5	524303-001	3	RECEPTACLE - Female
6	115419-001	3	BOLT
7	515610-027	3	SPRING-EXTENSION
8	192967-001	3	MOUNTING, SPRING
9	-	6	NUT, Hex., #10-32
10	-	6	WASHER, Lock, #10
11	-	6	WASHER, Flat, #10
12	515000-177	12	NUTSERT, #1/4-20
13	192831-002	3	MECHANISM HOUSING, ARM
14	515380-033	3	ROLL PIN
15	193081-001	3	CLAMP-LEVER
16	515610-028	3	SPRING-COMPRESSION
17	-	3	SCREW, Set, #6-32 x 3/8" Lg.
18	-	3	SCREW, Set, #10-32 x 1/2" Lg.
19	192820-003	3	CAM
20	192873-002	3	SHAFT, RETURN ARM
21	-	6	WASHER, Flat, #10
22	-	6	WASHER, Lock, #10
23	-	6	SCREW, Pan Head, #10-32 x 1/2" Lg.
24	192835-001	3	RETURN-ARM ASSEMBLY
25	515700-061	3	"E"-RING
26	515000-173	3	BUSHING
27	192691-010	3	AXLE-SHAFT ASSEMBLY
28	192814-001	3	SWIVEL BRACKET
29	-	3	NUT, Hex., #8-32
30	-	3	SCREW, Hex., #10-32
31	-	3	WASHER, Flat, #10
32	192688-020	3	POST
33	-	3	NUT, Hex., #10-32
34	192687-001	3	SHAFT
35	192172-001	3	ROLLER
36	515700-107	3	"E" RING
37	-	-	-
38	-	12	SCREW, Sheet Metal, #8
39	193665-001	3	END CAP

**ELF - IC (Endless Loop)
Film Transport System
Section 5**

ITEM	PART NUMBER	QTY	PART NAME
40	515700-112	6	SPEED NUTS, Clips
41	524203-022	3	PLUG, 3 Prong
42	528100-006	3	MOTOR, (90 Volts, 1.1 Amp., 1/10 H.P.)
43	-	12	BOLTS, #1/4 X 1/2" Lg.
44	192839-001	3	SUPPORT - MOTOR
45	515000-232	6	MOTOR BRUSH SPRING
46	599000-091	6	MOTOR BRUSH SPRING
47	598700-059	6	CAP
48	-	-	-
49	-	6	BOLTS, #1/4-20 x 1/2" Lg. & Lock Washers
50	-	6	WASHER, #1/4
51	192844-001	3	BRACKET - PIVOT
52	515800-008	3	RUBBER BUMPER
53	192826-001	3	DRIVE WHEEL
54	-	-	-
55	-	-	-
56	546536-001	2	BULB, 36 Volts
57	546700-037	2	INDICATOR - WHITE
58	515380-025	3	ROLL PIN
59	193552-001	3	PLATE, Socket
60	515310-009	24	POP RIVET

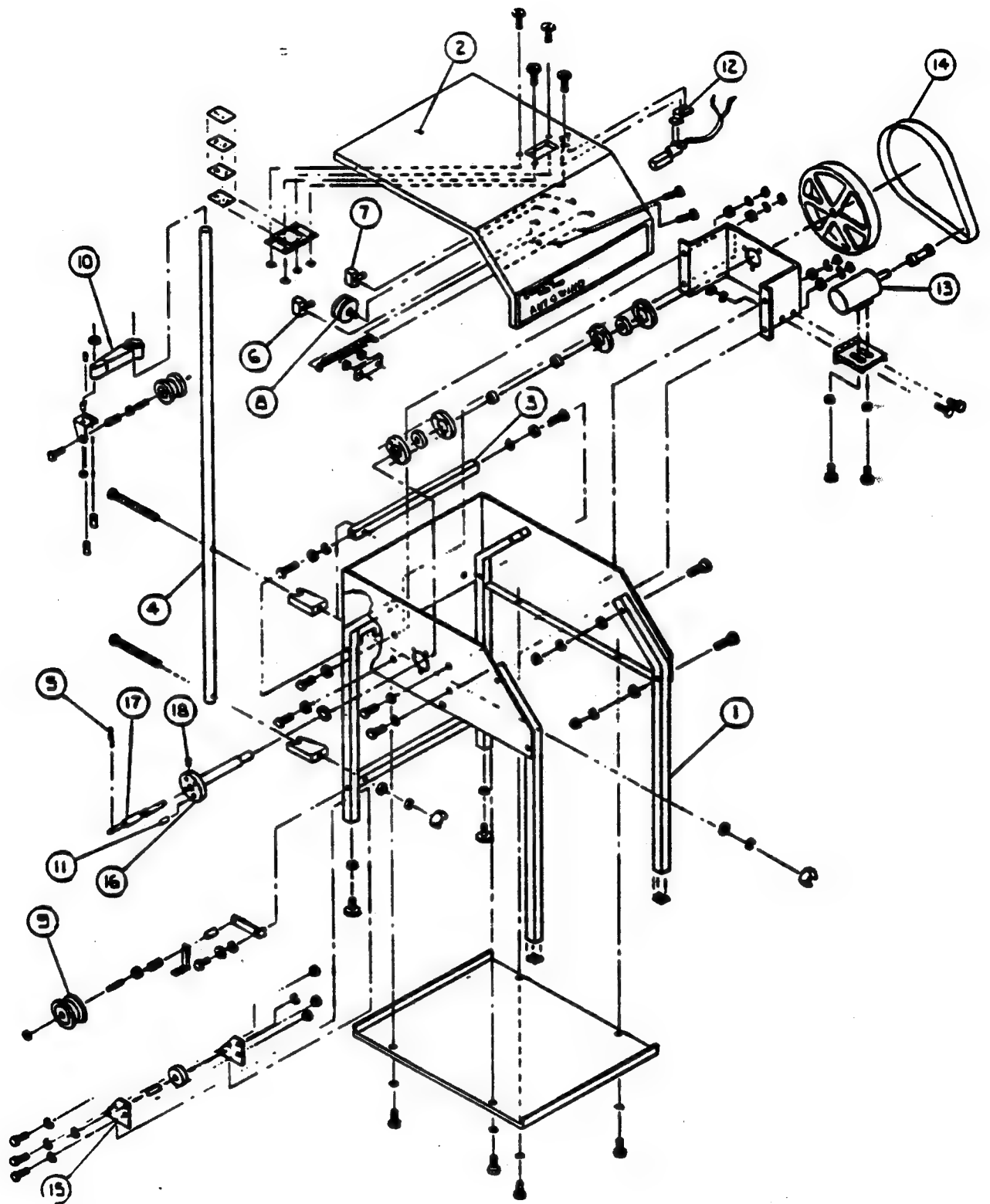


DOOR PANEL AND CONTROL MODULES

ELF - IC (Endless Loop)
Film Transport System
Section 5

DOOR PANEL AND CONTROL
MODULES

ITEM	PART NUMBER	QTY	PART NAME
1	578000-042	1	OFF / ON SWITCH
2	192934-001	1	SWITCH ASSEMBLY, Selector For Make-Up Brake Down Mode
3	555030-903	3	RESISTOR, 25 Watts, 3 Ohms
4	194548-002	1	TRANSFORMER, Step-Down
5	117509-003	1	L.E.D. POWER CONTROL CARD
6	192883-001	3	MOTOR CONTROL CARD
7	524715-005	4	SOCKET, 15 Pin, 90 Degrees
8	546530-001	1	OFF/ON INDICATOR LIGHT BULB
9	193667-019	1	PANEL DOOR MODULE
10	515700-117	-	SCREW, Captive, #1.4-20
11	546105-008	2	FUSE, 125 Volts, 5 Amperes



MK MAKE-UP TABLE

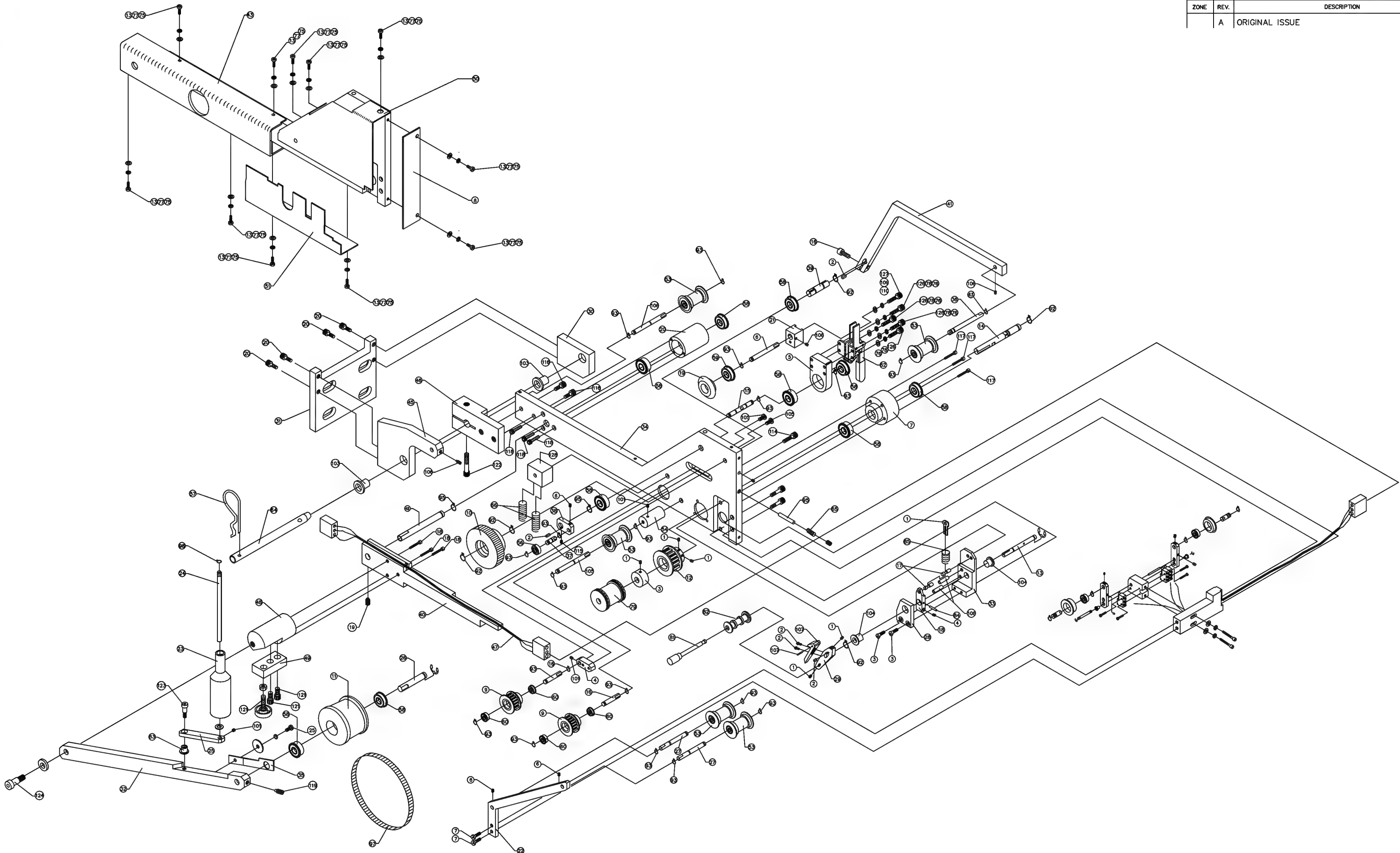
**ELF - IC (Endless Loop)
Film Transport System
Section 5**

MK/MAKE-UP TABLE

ITEM	PART NUMBER	QTY	PART NAME
1	193084-001	2	FRONT LEG
2	192865-001	1	TABLE TOP ASSEMBLY
3	192155-001	1	HORIZONTAL BAR ASSEMBLY
4	192158-002	1	ROLLER POST
5	515000-117	1	CLIP
6	578712-012	1	TOGGLE SWITCH, Spindle-Platter
7	578722-013	1	TOGGLE SWITCH, Brake-Switch
8	193067-001	1	SPEED CONTROL
9	194209-002	2	ROLLER, with Needle Bearing
10	192864-001	1	SWIVEL ROLLER ASSEMBLY
11	192160-001	1	DRIVE PIN
12	546650-002	1	LIGHT
13	193060-001	1	MOTOR ASSEMBLY
14	515000-190	2	DRIVE BELT
15	192674-001	1	WHEEL ASSEMBLY
16	192254-001	1	REEL SHAFT HOUSING
17	192159-001	1	REVERSIBLE SHAFT
18	192167-002	1	SCREW, <i>Locking</i>
19	193083-001	2	REAR LEG

THESE DRAWINGS AND SPECIFICATION ARE THE EXPRESS PROPERTY OF CHRISTIE INCORPORATED, AND SHALL NOT BE REPRODUCED OR COPIED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS WITHOUT EXPRESS WRITTEN PERMISSION OF CHRISTIE INCORPORATED.

REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
	A	ORIGINAL ISSUE	5-29-87
			APPROVED
			M.H.



1.) FOR PARTS SEE PARTS LIST 194372-001

NOTES: UNLESS OTHERWISE SPECIFIED

QTY REQD		CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION			MATERIAL SPECIFICATION	ITEM NO.	
PARTS LIST									
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX± .XX ±.X ± .XXX± .XXX			CONTRACT NO.		CHRISTIE INCORPORATED TITLE1 TITLE2				
			APPROVALS	DATE					
			DRAWN	DRAFTER					XX.XX.XX
			CHECKED						
			APPROVED						
PART.NO.		PART.NO.				DWG.NO.			REV L
NEXT ASSY		USED ON				DWG.NO.			
APPLICATION			DO NOT SCALE DRAWING		ISSUED		SCALE X: X		SHEET # OF #

3002

BOM Revisions

Branch/Plant . . . CHR

①

Bill Type. . . . M

Item Rev. Level. A

Action Code. . . I

Parent Item. . . 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

As of Date . . . 01/19/00

Skip to Comp Line No. . . .

O	Component Item	Description	Quantity Per	UM	V	I
	119073-003 2	SQUARE KEY	4.00	EA	V	I
	194043-001 3	LOWER DRIVE HUB SPROCKET	1.00	EA	V	I
	194244-001 4	SLIDER-BELT TENSIONER	1.00	EA	V	I
	194455-001	TOGGLE CLAMP ASSY	1.00	EA	V	I
	194247-001 7	HOUSING-BEARING FILM SPROCKE	1.00	EA	V	I
	194248-001 8	COVER-FRONT PLATE	1.00	EA	V	I
	194249-001 9	PULLEY-IDLER GEAR, 1/5 PITCH;	2.00	EA	V	I
	194250-001 10	MODIFIED DRIVE GEAR	1.00	EA	V	I
	194253-001 12	FILM SPROCKET PULLEY BELT	1.00	EA	V	I
	194254-001 13	SHAFT, DETENT-ARM	1.00	EA	V	I
	194255-001 14	FILM SPROCKET SHAFT	1.00	EA	V	I
	194256-001 15	SHAFT, BEARING DRIVE GEAR	1.00	EA	V	I

Opt: 1=Item Master 2=Next Lvl 6=Subs 7=Text F8=Inquiry F12=Prv Lvl F24=More

3002

BOM Revisions

Branch/Plant . . . CHR

②

Bill Type. . . . M

Item Rev. Level. A

Action Code. . . I

Parent Item. . . 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

As of Date . . . 01/19/00

Skip to Comp Line No. . . .

O	Component Item	Description	Quantity Per	UM	V	I
	194257-001 16	IDLER PULLEY BEARING SHAFT	2.00	EA	V	I
	194260-001 108	TENSION ARM SPRING SUPPORT	1.00	EA	V	I
	194261-001 18	DETENT ARM	1.00	EA	V	I
	194265-001 20	HOUSING PIVOT; LOWER TENSION	1.00	EA	V	I
	194251-001 11	ROLLER-PRESSURE	1.00	EA	V	I
	194287-001 107	FAILSAFE ASSEMBLY TRIGGER	1.00	EA	V	I
	194288-001 28	UPPER SECTION DETENT ARM BLO	1.00	EA	V	I
	194289-001 29	MODIFIED ROLLER ARM PAD	1.00	EA	V	I
	194292-001 30	LOWER FEEDARM MTG BRACKET	1.00	EA	V	I
	194293-001 31	FEED ARM MTG PLATE; ELF 1C	1.00	EA	V	I
	194297-001 33	BOTM SECT DETENT PAD RLLR BL	1.00	EA	V	I
	194301-001 34	PLATE ARM; ELF-1C	1.00	EA	V	I

3002

BOM Revisions

Branch/Plant CHR

(3)

Bill Type. M

Item Rev. Level. A

Action Code. I

Parent Item. 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

As of Date 01/19/00

Skip to Comp Line No.

O	Component Item	Description	Quantity Per	UM	V	I
	194357-001 37	FEEDBACK CAM SHAFT	1.00	EA	V	I
	194358-001 38	CAM ARM	1.00	EA	V	I
	194359-001 39	SHAFT, TENSION ARM SUPPORT	1.00	EA	V	I
	194361-001 41	TENSION FEEDBACK LEVER	1.00	EA	V	I
	194362-001 42	FEEDBACK PIVOT SHAFT	1.00	EA	V	I
	194365-001 43	COVER, ELF ARM	1.00	EA	V	I
	194389-001 45	UPPER FEED ARM MTG BRACKET	1.00	EA	V	I
	194390-001 46	FEED ARM CLAMP	1.00	EA	V	I
	194404-001 47	FAILSAFE FEEDARM HARNESS ASS	1.00	EA	V	I
	194406-001 48	SUPPORT PRESSURE ROLLER ARM	1.00	EA	V	I
	194407-001 49	BLOCK, ARM PRESSURE ADJUST, EL	1.00	EA	V	I
	194428-001 50	CVR-LRG ELF-1C GEARBOX	1.00	EA	V	I

Opt: 1=Item Master 2=Next Lvl 6=Subs 7=Text F8=Inquiry F12=Prv Lvl F24=More

3002

BOM Revisions

Branch/Plant CHR

(4)

Bill Type. M

Item Rev. Level. A

Action Code. I

Parent Item. 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

As of Date 01/19/00

Skip to Comp Line No.

O	Component Item	Description	Quantity Per	UM	V	I
	194429-001 51	CVR-SM ELF-1C GEARBX	1.00	EA	V	I
	194259-001 17	PIN-SPRNG; DETENT ARM	2.00	EA	V	I
	515000-117 57	HAIR PIN COTT, INSERT INTO M	1.00	EA	V	I
	515000-251 58	BALL BEARING, FLANGED	10.00	EA	V	I
	515380-049 64	PIN, HITCH, QR	1.00	EA	V	I
	515610-038 65	SPRING-BELT TENSIONER	1.00	EA	V	I
	515610-039 66	SPR CPRSN; PAD ROLLER	2.00	EA	V	I
	515700-110 67	CRESCENT RING 1/4	4.00	EA	V	F
	515000-286 61	BEARING OILLESS	2.00	EA	V	I
	598931-022 69	SET SCREW, HEX 6-32x3/16"	2.00	EA	V	I
	598931-025 71	SCREW, SET, HEX 10-32x1/4"	1.00	EA	V	F
	598931-030 73	SCR, SHC 1/4-20X3/4	1.00	EA	V	F

3002

BOM Revisions

(5)

Branch/Plant CHR

Bill Type. M

Item Rev. Level. A

Action Code. I

Parent Item. 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

As of Date 01/19/00

Skip to Comp Line No.

O	Component Item	Description	Quantity	Per	UM	V	I
	598931-046 74	SCR, SHC 8-32x3/4"	9.00		EA	V	I
	598931-068 75	FLAT WASHER	11.00		EA	V	F
	598931-074 76	FLAT WASHER#8	3.00		EA	V	I
	598931-083 77	WASHR SPLIT#6	11.00		EA	V	F
	598931-084 78	WASHR SPLIT#8	3.00		EA	V	I
	598931-107 79	FILM SPROCKET ONLY	1.00		EA	V	I
	598931-116 81	PAD RLR SHAFT, (STUD ASSEMBLY	1.00		EA	V	I
	598931-117 82	PAD ROLLER (METAL)	1.00		EA	V	I
	598931-131 84	SPRING PIN	1.00		EA	V	I
	598931-141 85	CPRSN SPRING	1.00		EA	V	I
	598931-163 86	SCR, SHC 8-32X1	2.00		EA	V	I
	598931-278 87	SCR, BUTTON HD, HEX SOCKET 6-	1.00		EA	V	I

Opt: 1=Item Master 2=Next Lvl 6=Subs 7=Text F8=Inquiry F12=Prv Lvl F24=More

3002

BOM Revisions

(6)

Branch/Plant CHR

Bill Type. M

Item Rev. Level. A

Action Code. I

Parent Item. 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

As of Date 01/19/00

Skip to Comp Line No.

O	Component Item	Description	Quantity	Per	UM	V	I
	598931-299 88	SET SCR, HEX 10-32X3/16", SS	9.00		EA	V	I
	598931-315 89	SCR, SHC 1/4-20X1/2	8.00		EA	V	I
	598931-403 90	SCR, SHC, 2-56X3/16	7.00		EA	V	I
	598931-448 92	RETAINING RING, EXT, 3/8 ID	14.00		EA	V	I
	598931-449 93	RET. RING 1/4 ID	23.00		EA	V	I
	598931-452 94	SCR BUTTON HEAD	5.00		EA	V	I
	598931-453 95	PUSH ROD	1.00		EA	V	I
	598931-454 96	SHCS 1/4 20X1/2 L	1.00		EA	V	F
	598931-455 97	TIMING BELT	1.00		EA	V	I
	598931-457 98	PRECISION WASHER	1.00		EA	V	I
	598931-462 102	SET SCREW 6-32X1/2	2.00		EA	V	I
	194279-001 22	FILM FEED ROLLER SUPPORT	1.00		EA	V	I

3002

BOM Revisions

⑦

Branch/Plant CHR

Bill Type. M

Item Rev. Level. A

Action Code. I

Parent Item. 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

Skip to Comp Line No.

As of Date 01/19/00

O	Component Item	Description	Quantity Per	UM	F	V	I
	194280-001 23	ROLLER, FILM LAYDOWN (ARM)	1.00	EA	V	I	I
	194281-001 24	SHAFT, FILM LAYDOWN (ARM)	1.00	EA	V	I	I
	194282-001 25	ARM-LAYDOWN (ELF)	1.00	EA	V	I	I
	194284-001 26	SHAFT-PRESSURE ROLLER	1.00	EA	V	I	I
	194296-001 32	PRESSURE ROLLER ARM (ELF)	1.00	EA	V	I	I
	194305-001 35	SPRING-PRESSURE ROLLER	1.00	EA	V	I	I
	194360-001 40	ARM-FEEDBACK POSITION	1.00	EA	V	I	I
	194489-001 54	SUPPORT-FIRST FILM ROLLER AR	1.00	EA	V	I	I
	194496-001 55	FAILSAFE ASSEMBLY	1.00	EA	V	I	I
	515000-109 56	BEARING	1.00	EA	V	I	I
	515000-253 60	BRG. 1/4" F	4.00	EA	V	I	I
	515000-291 63	BEARING, FLANGED, BRZ., .25ID	1.00	EA	V	I	I

3002

BOM Revisions

⑧

Branch/Plant CHR

Bill Type. M

Item Rev. Level. A

Action Code. I

Parent Item. 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

Skip to Comp Line No.

As of Date 01/19/00

O	Component Item	Description	Quantity Per	UM	F	V	I
	598931-023 70	SET SCR, HEX 8-32x3/16"	2.00	EA	V	I	I
	598931-422	SET SCR, HEX 1/4-20x3/8"	1.00	EA	V	I	I
	598931-408 91	SCR, FH, 82, 6-32X3/8"	4.00	EA	V	I	I
	598931-458 99	SHOULDER SCREW HEX	1.00	EA	V	I	I
	598931-459 100	SCREW BUTT HEAD	1.00	EA	V	I	I
	598931-461 101	SCREW 8-32 BUTT HD	2.00	EA	V	I	I
	598931-464	BEARING BRONZE	2.00	EA	V	I	I
	194488-001 53	35MM ROLLER, ELF, ASSEMBLY	5.00	EA	V	I	I
	598931-033	SCR, SHC 1/4-20X1-1	1.00	EA	V	F	I
	194562-001	SHAFT-1ST FEED ARM ROLLER (E	1.00	EA	V	I	I
	194563-001	SHAFT-2ND FEED ARM ROLLER (E	1.00	EA	V	I	I
	194564-001	SHAFT-3RD FEED ARM ROLLER (E	1.00	EA	V	I	I

Opt: 1=Item Master 2=Next Lvl 6=Subs 7=Text F8=Inquiry F12=Print

3002

BOM Revisions

⑨

Branch/Plant CHR

Bill Type. M

Item Rev. Level. A

Action Code. I

Parent Item. 194372-001

FEEDARM ASSY ELF-1C

Drawing # P/L

Skip to Comp Line No.

As of Date 01/19/00

O	Component Item	Description	Quantity Per	UM	F	V	I
	194565-001	SHAFT-4TH FEED ARM ROLLER (E	1.00	EA	V	I	I
	194566-001	SHAFT-5TH FEED ROLLER (ELF)	1.00	EA	V	I	I
	515500-005	SCREW, SHOULD, ALLEN HEAD 5/16	1.00	EA	V	I	I

**ELF - IC (ENDLESS LOOP)
FILM TRANSPORT SYSTEM
SECTION 6**

FILM THREADING PROCEDURE

- 6.1 Lift the Take-Up ring straight up from the center *(or whichever platter the film is ON)* by pinching the ends of the Take-Up ring together. Then place the ring on an empty platter. *(With the Autowind System, film can be fed from any platter and rewound back onto any other empty platter of the system).*
- 6.2 Take the end of the film from the inside of the loop *(just removed from the slot in the Take-Up ring)* and thread it around the feed arm *(Figure 8, #1)*. As the film is pulled, the platter will turn and feed film as required *(Power On Switch set to ON)*.
- 6.3 Continue by carrying the film to the vertical column and threading onto the rollers on the vertical column, as shown in *(Figure #1 & #4)*. After the film has been threaded through the top roller assembly *(Figure 4, #2)*, pull enough film through to go to the projector and back again to the Autowind.
- 6.4 Thread the film through the projector in the normal manner. If the projectionist at this point wants to check for proper projector threading or "framing", start the projector or run it manually for a few frames.
- 6.5 Return the start of the film to the Autowind through the bottom roller assembly *(Figure 1, #6)*, and cluster roller *(Figure 1, #4)*, to the platter of the Autowind where the Take-Up ring was previously placed. Move the return arm to the vertical column and hold it there. Place the film around the return roller and insert the end of the film into the slot of the Take-Up ring.
- 6.6 If there is any excess slack in the film at this point, it should be taken out as follows:

While guiding the film on the return arm roller, move the return arm slowly away from the vertical column. When the arm is about 14 to 16 inches away from the vertical column, the platter will begin to turn slowly. Allow the platter to rotate at a slow speed until all the slack is taken out of the film from the projector. When the slack is gone, release the arm.

Make Sure The Take-Up Arm Is Set In Such Position That The Platter Motor Starts As Soon As The Projector Starts. This Is Very Important, Especially For 70 mm. (This Position Is Easily Obtained By Turning Platter Clockwise Until Platter Motor Starts Pulling The Film).

- 6.7 The Autowind System is now ready for operation with the projector. Before starting the projector, check that ALL of the previous steps in this manual have been fully carried out.

ELF - IC (Endless Loop)
Film Transport System
Section 6

RECOMMENDATION:

The recommended procedure for optimum Autowind is as follows;

- ◆ For the best performance of the Autowind System, after it is loaded, Christie recommends that, if there are two separate films, the program be split onto two platters, one film each. This assures a smoother feed of the film from the platter and reduces the possibility of oscillation due to dirt, static electricity and old brittle film.
- ◆ It is recommended that the projection booth temperature is kept at around 70 (degrees) "F". At lower temperature, the film tends to become brittle and stiff, which can cause oscillation and erratic operation of the feed arm.

- 6.8 Check that the power switch is pushed IN to the ON position and the pilot light is ON. Start the projector and watch both the feed and return platters on the Autowind. During the initial start-up, there may be some oscillation of the return and feed arms, but this condition should settle down to a reasonable equilibrium condition within a minute or two.

There might be some lag of the film feed during the first 6 - 8 revolutions of the feed sequence. This is quite normal. The platter will soon obtain proper operating position (approximately midway between start and maximum speed). If the film starts wrapping around the center feed control assembly more than 3 - 4 times during the first 10 - 20 revolution a malfunction has occurred. Stop the projector and check the platter speed. (see Troubleshooting guide).

Unless a serious malfunctions occurs, DO NOT TURN OFF the projector until the take-up arm and platter have time to settle down to a steady operating condition. If the projector is turned OFF quickly after being started, film breakage may result due to momentum of the platter. Similarly, DO NOT "INCH" the projector by turning the motor ON and OFF rapidly.

BILL OF MATERIALS

ENDLESS LOOP SYSTEM (ELF-IC) FINAL ASSEMBLY (P/N: 194400-001)

ITEM	PART NUMBER	QTY	UOM	PART NAME
1	194528-001	1.00	EA	FILM FEED POINT, TOP ROLLER
2	194529-001	1.00	EA	FILM FEED POINT, SLIDE ROLLER
3	194530-001	1.00	EA	TOP SLIDE BAR ASSEMBLY
4	194108-001	1.00	EA	CENTER FEED PLATE ASSEMBLY
5	193032-003	1.00	EA	SLIDE BAR CLUSTER ASSEMBLY
6	194372-001	1.00	EA	FEEDARM ASSEMBLY, ELF-IC
7	194425-001	1.00	EA	TOP ROLLER ASSEMBLY KIT
8	194502-001	4.00	EA	TAKE-OFF RLR ASS'Y, STD. 35 mm
9	193668-001	1.00	EA	DOOR MODULE ASS'Y, AW3,MW3R
10	194468-001	1.00	EA	EXT. MECH. ASSEMBLY - ELF
11	192899-001	2.00	EA	PLATTER ASS'Y, ALUMINUM-AW3
12	596000-161	1.00	EA	CARTON, INS. PARTS
13	596000-163	2.00	EA	DUNNAGE, BUILT-UP
14	596000-164	1.00	EA	DUNNAGE, BUILT-UP
15	194397-001	3.00	EA	SANDBAG - FILM LOADING - ELF
16	115713-001	2.00	EA	TAKE-UP RING ASSEMBLY
17	192862-001	2.00	EA	PLATTER DRIVE ASS'Y-BODINE
18	194531-001	1.00	EA	LABELS: 8 (2-7/16 x 3-7/8)
19	515000-073	3.00	EA	PLUG BUTTON, FOR .625 DIA. H
20	196051-001	2.00	EA	AXLE ASS'Y, REMOVABLE TYPE
21	546536-001	2.00	EA	BULB 36V, WORK LITE
22	194403-001	1.00	EA	HARNES-FAILSAFE COLUMN-ELF
23	515000-069	15.60	IN	CHAIN #00
24	192798-001	3.00	EA	BRACKET, PLUG MTG. MOLEX
25	193553-001	1.00	EA	PLATE-CONNECTOR
26	518110-005	1.00	EA	CLAMP-LOOP; STRAIN RELIEF-5/8
27	192847-002	3.00	EA	CONTROL SENSOR ASSEMBLY
28	193665-001	3.00	EA	END CAP ASS'Y-ATTACHES to END
29	583218-004	1.00	EA	TRMNL-LUG; INS.RING-RED, 22/16
30	193111-001	1.00	EA	KIT-AW3/AW35R SUPPLEMENTAL
31	196050-001	1.00	EA	FEED PL, REMOVABLE TYPE, STD.
32	192879-001	3.00	EA	SWIVEL ROLL ASS'Y, RET ARM
33	193552-001	3.00	EA	PLATE-SOCKET
34	515000-158	3.00	EA	THRUST BEARING,PLATTER AXLE
35	114863-002	8.00	EA	ANTI-SKID ASSEMBLY - 35 mm
36	192876-001	1.00	EA	BOTTOM ROLL ASS'Y, STD. 35 mm
37	117509-001	1.00	EA	L.E.D. CARD
38	192877-001	1.00	EA	CLUSTER ROLL ASS'Y, STD. 35 mm

**Bill Of Materials
ELF - IC (Endless Loop)
Film Transport System
Section 6**

ITEM	PART NUMBER	QTY	UOM	PART NAME
39	520650-003	2.00	EA	LEVELING FOOT ASSEMBLY
40	515310-009	24.00	EA	POPRIVET 1/8 x .375 ST. STL
41.	192883-001	3.00	EA	MOTOR CONTROL CARD
42	192835-001	3.00	EA	RETURN ARM ASS'Y, ARM ONLY
43	192880P080	1.00	EA	AW3-HARNESS ASS'Y COLUMN
44	515200-047	52.00	EA	NUTSERT, 1/4-20
45	515000-174	6.00	EA	FLANGED BEARING-DRIVE MTR
46	596000-153	3.00	EA	AXLE COVER
47	194368-001	1.00	EA	FILM HOLD-DOWN ASSEMBLY
48	192477-001	3.00	EA	HOUSING SPRING, BRASS CUP
49	515000-159	3.00	EA	THRUST WASHER, PLATTER AXLE
50	515000-157	3.00	EA	THRUST WASHER, PLATTER AXLE
51	194383-001	1.00	EA	PLATTER DRIVE ASS'Y, (ELF-IC)
52	515700-112	6.00	EA	SPEEDNUT #8, TYPE U
53	583900-009	3.00	EA	TRMNL LUG; INS, WIRE CONN.
54	546700-037	2.00	EA	LIGHT, INDICATOR AW3
55	507702-163	.50	FT.	INSULATION, TUBING-CLEAR .160
56	515610-025	3.00	EA	SPRING-COMPRESSION RET. ARM
57	518600-017	24.00	IN	INSULATOR-PAD; SPONGE RUBR
58	192859-001	2.00	EA	RETURN ARM MECHANISM ASS'Y
59	526030-012	1.00	EA	LEAD ASS'Y, CORD & PLUG ASS'Y
60	194347-001	1.00	EA	ADAPTER FEED PLATE (ELF-IC)
61	194363-001	1.00	EA	ADAPTER ASS'Y - FEED PLATE
62	194046-001	1.00	EA	SLIDEBAR; REAR; (ELF-IC)
63	194047-001	2.00	EA	TOP/BTM SPACER; REAR SLIDE
64	194090-001	2.00	EA	SPACER CLUSTER-SLIDE BAR
65	193565-001	1.00	EA	BASE WELDMENT
66	194299-001	1.00	EA	PLATTER ASSEMBLY (ELF-IC)
67	515310-036	24.00	EA	POPRIVET, 1/8 x .375 ALUMINUM
68	518506-101	2.00	EA	CLAMP-GROMMET; 5/8 GRV. x 1/2
69	193670-003	1.00	EA	COLUMN ASS'Y, AW3, SCREEN
70	TD-611	1.00	EA	OPERATOR'S MANUAL ELF-IC
71	524630-034	3.00	EA	DUST COVER, PLASTIC
72	515000-076	1.00	EA	PLUG-BUTTON for .875 Dia. HOLE
73	515000-302	1.00	EA	PLUG-BUTTON for .687 Dia. HOLE
74	596000-190	1.00	EA	CRATE, (ELF-IC)

WARRANTY

COVERING AUTOWIND (AW-MW- & ELF) FILM HANDLING SYSTEM

Manufactured by: **CHRISTIE INCORPORATED**
(herein referred to as "*Christie*")

Christie warrants the apparatus sold to the extent of the parts necessary to correct any defect in workmanship or materials which may develop under proper and normal use for a period of one (1) full year (*90 days on electric motors*) from the date of installation (*except as noted below*) but not to exceed eighteen (18) months from the date of shipment from Christie Incorporated. Christie reserves the right to have the apparatus returned, freight prepaid, to Christie factory to effect the warranty repairs.

Replacement parts for warranty repairs will be shipped promptly by Christie f.o.b. factory, and invoiced to the customer. Credit will be issued upon return of the defective part(s), prepaid, to the Christie factory.

The above shall constitute a fulfillment of all Christie liabilities in respect to said apparatus.

This warranty does not cover:

Special customer specified purchased parts, materials, or components modified to customer specifications.

This warranty does not apply to parts of any Christie product which have been opened, disassembled, repaired, or altered by anyone other than Christie, or subjected to misuse or abuse.

Christie shall not be liable for any consequential damages.